Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

Ec 7Agr

Agricultural Economics RESEARCH

CONTENTS FOR OCTOBER 1961 *Vol. XIII, No. 4*

		Page
Buying Versus Renting a Combine	*Edward J. Smith*	109
Governmental Problems on the Urban Fringe	*Frederick D. Stocker*	117
Rural Problem Areas Need Better Schools	*William S. Folkman*	122
World Abstracts of Agricultural Economics Research		130
Book Reviews	*William B. Lord, Kenneth E. Ogren, William F. Hall* *Allen B. Paul, Alvin C. Egbert, Raymond J. Mischler* *Wayne D. Rasmussen, and Robert E. Post*	132

UNITED STATES DEPARTMENT OF AGRICULTURE • Economic Research Service

Contributors

EDWARD J. SMITH is an Agricultural Economist with the Economic Research Service, working primarily on the demand for nonfarm production inputs by agriculture, and the impact on the agricultural economy of the increasing use of nonfarm, or purchased inputs.

FREDERICK D. STOCKER, Agricultural Finance Branch, Farm Economics Division, Economic Research Service, is investigations leader on problems of farm taxation and rural government.

WILLIAM S. FOLKMAN is a Social Scientist in the Farm Population Branch, Economic Research Service. He is mainly concerned with research related to Rural Areas Development.

WILLIAM B. LORD is Assistant Professor in the Department of Agricultural Economics, College of Agriculture, University of Wisconsin. Professor Lord, a former employee of the Forest Service, has done graduate work in forestry, forestry economics, and agricultural economics.

KENNETH E. OGREN, Assistant Editor of this journal, is Director of the Marketing Economics Division of Agricultural Research Service.

WILLIAM F. HALL, an Agricultural Economist in Economic Research Service, specializes in analyzing data relating to India.

ALLEN B. PAUL, an Agricultural Economist in the Marketing Economics Division of the Economic Research Service, is a past contributor to our Book Reviews section.

ALVIN C. EGBERT is a member of the staff of the Agricultural Adjustments Branch, Farm Economics Division, Economic Research Service where he is concerned with production needs and response.

RAYMOND J. MISCHLER is in the Office of the General Counsel, U.S. Department of Agriculture. His primary activity is related to legal work for the Farmer Cooperative Service.

WAYNE D. RASMUSSEN is Chief of the Agricultural History Branch, Economic and Statistical Analysis Division, Economic Research Service.

ROBERT E. POST, Head of the Food Grains Section, Economic and Statistical Analysis Division, Economic Research Service, for many years has conducted research and prepared economic reports on rice. He regularly prepares *The Rice Situation* and similar material for other U.S. Department of Agriculture publications.

Editors: Charles E. Rogers
Rex F. Daly

Assistant Editors: Kenneth E. Ogren
M. L. Upchurch

AGRICULTURAL ECONOMIC RESEARCH

A Journal of Economic and Statistical Research in the
United States Department of Agriculture and Cooperating Agencies

Volume XIII OCTOBER 1961 Number 4

Buying Versus Renting a Combine

A Suggested Basis for Decision Making

By Edward J. Smith

From time to time, many farm operators are faced with a choice between buying one of several types and sizes of combines and hiring a custom machine. Heretofore, research studies designed to aid farmers in making sound decisions of this type have considered primarily the effect of annual use, or acreage harvested, on the costs of the various alternatives. This conventional analysis attempts to determine the annual acreage required to justify, on a cost basis, the purchase of a combine. Below this acreage, the hiring of a custom combine is more economical. Labor is usually valued at the going wage rate paid farm help in the area, and interest on investment is based on rates that local farmers pay for borrowed funds. This article points out why the conventional analysis often proves inadequate, and suggests a simple way in which these difficulties may be overcome by taking other important variables into account. While the suggested procedure is applied here to the problem of choosing the least-cost method of combining grain, it should prove equally useful for other economic problems of this type. The generous assistance of I. R. Starbird and E. L. Langsford, Farm Economics Division, Economic Research Service, who made available to the author data and specialized knowledge of the Mississippi Delta area, is gratefully acknowledged. The article has also benefited greatly from the comments and suggestions of R. V. Baumann, J. J. Csorba, A. S. Fox, M. S. Parsons, and M. L. Upchurch, Farm Economics Division, Economic Research Service.

IN THE MISSISSIPPI DELTA, oats and soybeans are the chief crops harvested with combines. This analysis applies to a farm situation that is commonly found in the area where both of these crops are grown and where the soybean acreage equals or to some extent exceeds that of oats.

These farm operators can choose between hiring a custom combine, buying one or two 7-foot power-takeoff machines, or buying a 12-foot selfpropelled combine. This article is designed to show under what conditions (acreage, cost of labor, or cost of capital) each of these methods is the least-cost choice. It is assumed that custom machines are available when needed, and that the quality of the job they do is comparable to that done with either size of owned combine. For the sake of simplicity, it is also assumed that the custom rate per acre is the same regardless of number of acres harvested. Depreciation costs of the owned machines are based on a useful life of 10 years.

The cost data and performance rates are based on unpublished data from a 1959 survey in the Mississippi Delta, made by Irving Starbird of the Economic Research Service (table 1). Per acre costs are calculated for a wide range of annual harvested acreages. The fixed and variable cost components and their total are shown in table 2.

The Conventional Analysis

For illustrative purposes, interest on investment is charged at 5 percent, and labor is valued at $1 an hour. At these cost rates, the competitive position of the various alternatives can readily be shown in chart form (fig. 1). The least-cost method for a given acreage is easily determined—it is always the bottom line at that point (acreage) on the chart. In the present case, the least-cost alternative is custom combining up to about 94 acres per year. Above this point, the overhead costs of an owned 7-foot power-takeoff machine are spread over enough acres so that this machine takes over as the least-cost choice and holds its advantage up to its maximum annual capacity (250 acres).[1]

But what if the operator's risk aversion is such that he prefers to keep a little more excess capacity available, even at a somewhat higher per unit cost? If he is reluctant to try to handle more than, say, 200 acres with a single 7-foot machine, he may choose to buy the 12-foot self-propelled machine, since it is the next-to-lowest cost method. Under these cost conditions, two 7-foot combines do not become the most economical alternative at any point.

This is essentially the conventional type of analysis of the problem. The method has usefulness in the case of a single farm, or for a homogeneous group of farms with the appropriate opportunity cost of labor and capital approximately the same for each farm in the group. This might be the case with a group of farms when the purchase of a combine involves borrowing money and hiring extra help during the harvest season, with both freely available at the standard rate—that is, having no important competing uses.

TABLE 1.—*Performance rates and costs for 7-foot power-takeoff and 12-foot self-propelled combines, Mississippi Delta* [1]

Item	Unit	7-foot combine	12-foot combine
Capacity per hour	Acre	1. 0	2. 0
Labor per acre	Man-hour	1. 0	. 5
Costs:			
Fixed costs per year:			
Depreciation	Dollar	180. 00	472. 50
Other	do	70. 00	183. 75
Total	do	250. 00	656. 25
Variable costs per acre:			
Combine operating costs.	do	1. 23	1. 40
Tractor operating costs.	do	. 60	--------
Total	do	1. 83	1. 40

[1] Based on unpublished data from a 1959 survey in the Mississippi Delta by Irving Starbird, Farm Economics Division, ERS, USDA. Costs and labor requirements for hauling and storing the combined grain are not included under either of the above methods, nor are they covered by the custom rates used.

But this is not the usual case. There are a great many farm situations to which the prevailing rates of wages and interest do not apply. Unless competent hired help is readily available during the harvest season, the appropriate value of the farmer's labor is more likely to be what it can earn in a competing use. Neither can one safely assume that additional capital is available to each farmer in the group at essentially the same rate. Voluntary or involuntary capital rationing is more likely to be found in varying degree within any otherwise homogeneous group of farms. Farm operators are usually able (or willing) to borrow only limited amounts of money.

The question then arises, Will some competing use of the borrowed funds be more profitable than investing them in a combine? This means that a single chart seldom has general applicability. For analysis, a separate chart is required for each combination of capital and labor cost rates (opportunity costs). This is a serious limitation in demonstrating how variations in the opportunity costs of labor and capital affect the choice of the least-cost method of combining.

The Suggested Procedure With Two Alternatives

However, the "break-even points" of the conventional analysis provide a ready means of generalizing the charts. By so doing, with only a few charts, the least-cost method can be readily determined for many combinations of capital and

---

[1] Capacity limits of 250 acres for the 7-foot power-takeoff combine and 500 acres for the 12-foot self-propelled machine are based on estimates made by those who are thoroughly familiar with harvesting conditions in the Delta areas. They reflect acreages that can be handled in all except the most unfavorable seasons with reasonable timeliness so that serious harvesting losses are not encountered.

TABLE 2.—*Per acre costs of combining with one 7-foot power-takeoff combine, two 7-foot power-takeoff combines, and one 12-foot self-propelled combine, with labor valued at $1 an hour, specified acreages, Mississippi Delta*

Acres harvested per year	One 7-foot combine			Two 7-foot combines			One 12-foot combine		
	Fixed costs per acre [1]	Variable costs per acre	Total costs per acre	Fixed costs per acre [1]	Variable costs per acre	Total costs per acre	Fixed costs per acre [1]	Variable costs per acre	Total costs per acre
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
25	10.00	2.83	12.83				26.25	1.90	28.15
50	5.00	2.83	7.83				13.12	1.90	15.02
75	3.33	2.83	6.16				8.75	1.90	10.65
100	2.50	2.83	5.33				6.56	1.90	8.46
125	2.00	2.83	4.83				5.25	1.90	7.15
150	1.67	2.83	4.50				4.38	1.90	6.28
175	1.43	2.83	4.26				3.75	1.90	5.65
200	1.25	2.83	4.08	2.50	2.83	5.33	3.27	1.90	5.17
250	1.00	2.83	3.83	2.00	2.83	4.83	2.62	1.90	4.52
300				1.67	2.83	4.50	2.19	1.90	4.09
350				1.43	2.83	4.26	1.88	1.90	3.78
400				1.25	2.83	4.08	1.64	1.90	3.54
450				1.11	2.83	3.94	1.46	1.90	3.36
500				1.00	2.83	3.83	1.31	1.90	3.21

[1] It is assumed that each combine can be used 2,500 hours but will be obsolete at the end of 10 years. Depreciation thus becomes a variable cost if the machine receives 2,500 hours of use before the end of the 10-year period.

labor cost rates and the principles of choice illustrated.[2] In an attempt to make the development easy to follow, we go from the conventional analysis to the more generalized one step by step. For the same reason, we first present an arithmetic example before developing the algebra, and illustrate its application with only two alternatives before applying it to all four possibilities.

To illustrate the possibilities of the new procedure, we return to figure 1. With a custom rate of $5.50 per acre, the break-even point with a 7-foot power-takeoff combine comes at about 94 acres; that is, at this acreage it costs the same by either method. Algebraically, this break-even point can be determined rather easily. If we let A stand for the annual harvested acreage, the right side of the following equation simply means that the total cost per acre with a 7-foot power-takeoff combine is the sum of the fixed cost per acre ($250/A) plus the operating costs per acre ($1.83), plus the labor cost per acre (1 hour per acre at $1.00 an hour). All that is needed is to find the number of acres that will make this sum equal $5.50.

That is:

$$5.50 = 250/A + 1.83 + 1\ (1.00)$$

Or,

$$250/A = 2.67$$

Solving,

$$A = 93.6.$$

This is the break-even acreage for a labor rate of $1 an hour. To generalize the analysis, various labor rates are substituted into the equation, and

---

[2] A single 3-dimensional model might be used effectively under some circumstances. This might be viewed from above, with the value of labor along one axis and the interest rate along the perpendicular axis. The height of the surface would then indicate the break-even acreage for the various combinations of capital and labor cost, and could be shown on 2-dimensional paper as acreage figures written in at the intersection of the appropriate wage and interest rates. The use of such a model presents several problems here, however. One difficulty is that the indeterminancy of the capacity limit cannot readily be shown. Another is the problem of showing, in a limited space, both the height of the "roof" and the identity of the least-cost zone that is above this roof and the one that is below it (since the roof, or surface, itself represents the break-even acreage). Finally, we see no very practical way of representing a double "roof," such as we have in the right-hand portions of both the upper and lower sections of fig. 3. Such a 3-dimensional model could be used quite effectively with only 2 alternatives, but with the four we are comparing here, it would seem more practical to use several 2-dimensional charts.

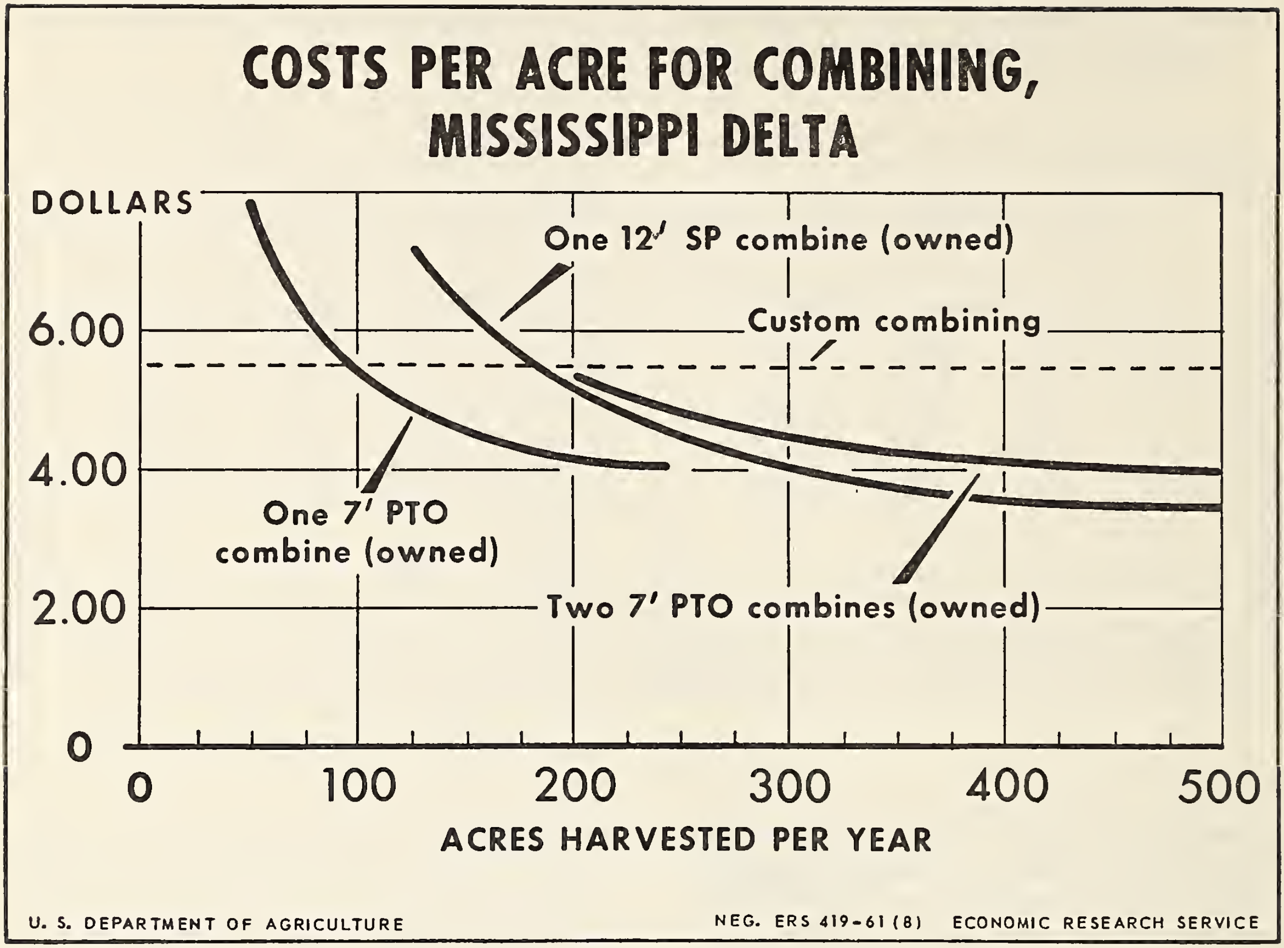

FIGURE 1.

each is solved for the break-even acreage.[3] When these points are plotted on a graph such as figure 2 and connected by a line, they separate those combinations of labor rates and acreage for which custom combining is cheaper and those for which it costs less to own a combine. For all acreage and labor-rate combinations to the left of and above the line in figure 2, the less costly alternative is to hire a custom combine, while for all combinations to the right of and below the line, it costs less to own a 7-foot power-takeoff combine. The clear area at the right-hand edge of the chart indicates the approximate capacity limit of the machine for a farm operator with a medium degree of risk aversion.

For extremely low labor rates, the costs of the two methods are approximately equal at about 75 acres. But the use of his own combine takes more of the farmer's labor than hiring a custom machine. Therefore, as the labor rates go up, so does the per acre cost of using his own combine. Thus, the competitive advantage of custom combining is increased at the higher labor rates, and larger and larger acreages are required to justify owning a combine.

---

[3] To do this, we use the following notation:

$\bar{V}_1$ = variable costs per acre of custom combining; that is, the custom rate per acre
F_2 = annual fixed cost of the owned combine (depreciation, interest, taxes, insurance, and housing)
$\bar{V}_2$ = variable or operating costs per acre of the owned combine and tractor
$\bar{L}_2$ = labor requirements in hours per acre with the owned combine
W = the value of labor per hour

Then the above equation can be represented in more general form as:

$$\bar{V}_1 = F_2/A + \bar{V}_2 + \bar{L}_2 W$$

To enable us to solve for A more conveniently, this can be rewritten as:

$$A = \frac{F_2}{\bar{V}_1 - \bar{V}_2 - \bar{L}_2 W}$$

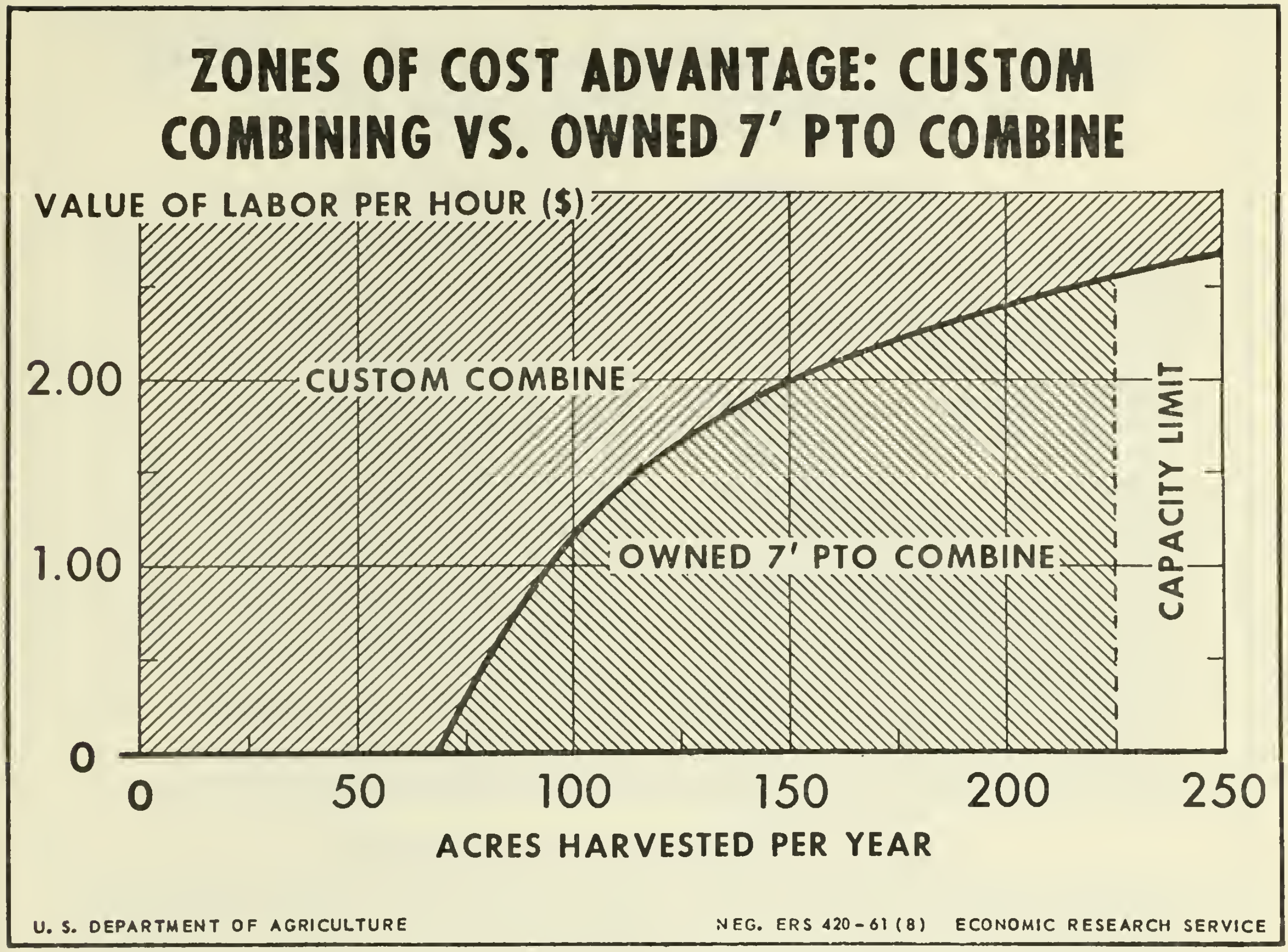

FIGURE 2.

The equal-cost line stops at 250 acres because it is not ordinarily feasible to try to cover a larger acreage of oats and soybeans in the Mississippi Delta with a single 7-foot power- takeoff machine. In fact, farm operators in this area who prefer to "play it safe" might try to handle no more than 200 acres of these crops in a season. Thus, somewhere betwen 200 and 250 acres, depending upon the degree of risk aversion of the particular farm operator, the equal-cost line loses its relevance. Cost savings may be more than offset by excessive harvesting losses if the least-cost method is pushed too far. This is the reason for the clear vertical areas of figures 2 and 3.

The Suggested Analysis Applied to the Four Alternatives

Figure 3 shows least-cost zones for the four alternative methods of combining. These include custom combining, one owned 7-foot power-takeoff machine, ownership of *two* 7-foot power-takeoff machines, and ownership of one 12-foot self-propelled combine. Interest on the investment in the owned machines is again charged at 5 percent in the calculations for the upper part of figure 3.

The calculation of the equal cost points between any two of these alternatives is similar to that described above; the two cost functions for a given labor rate are set equal to each other and the breakeven acreage is calculated.[4] This is repeated for enough labor rates to enable an equal-cost line to

---

[4] When both alternatives involve fixed costs, the algebra is more difficult. For example, the equation for determining the equal-cost line between the 12-foot SP and two 7-foot PTO machines is:

$$500/A+1.83+1.0W=656.25/A+1.40+0.5W$$

in which A represents acreage harvested annually and W the value of labor per hour.

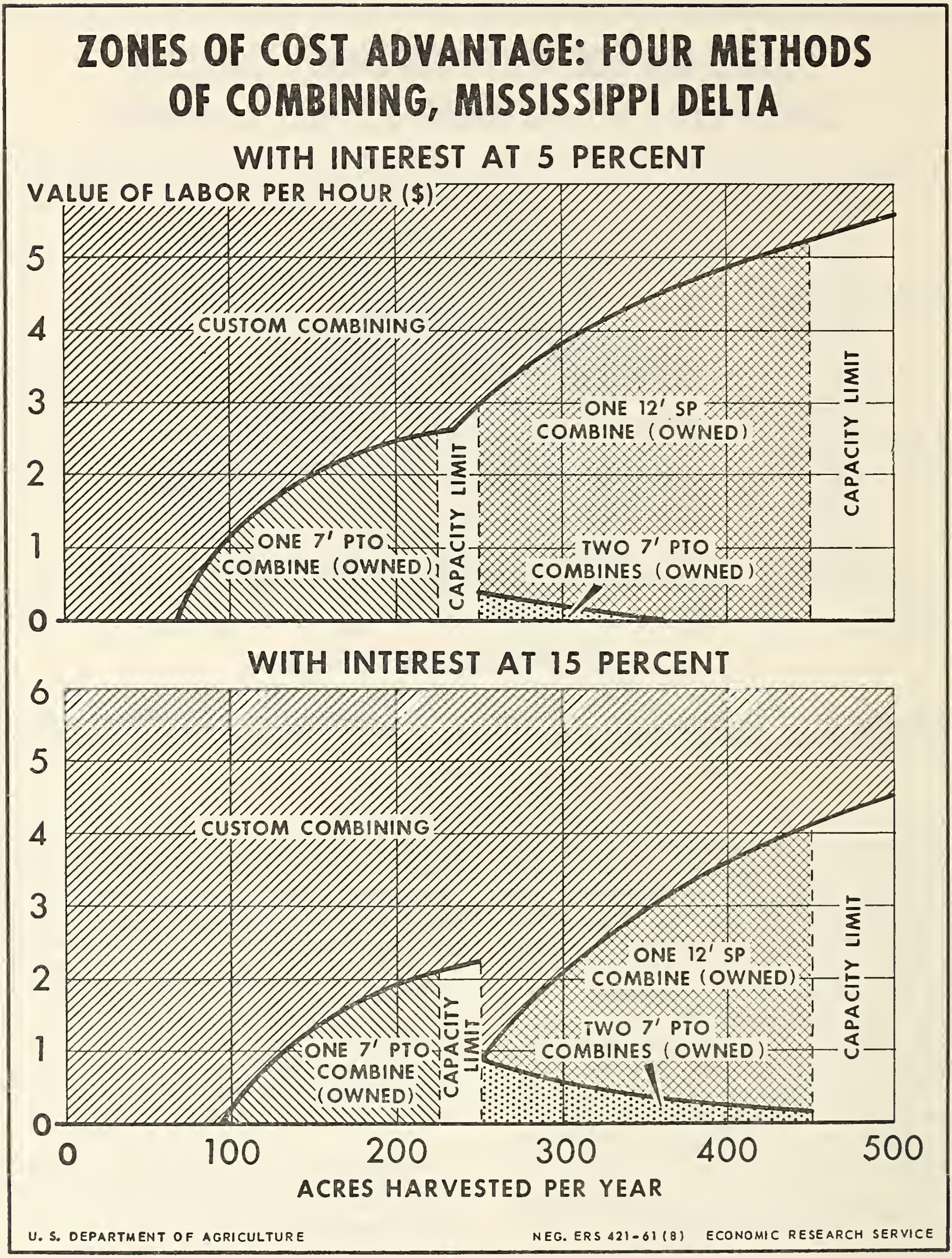
ZONES OF COST ADVANTAGE: FOUR METHODS OF COMBINING, MISSISSIPPI DELTA
WITH INTEREST AT 5 PERCENT
VALUE OF LABOR PER HOUR ($)
0
1
2
3
4
5
CUSTOM COMBINING
ONE 7′ PTO COMBINE (OWNED)
CAPACITY LIMIT
ONE 12′ SP COMBINE (OWNED)
TWO 7′ PTO COMBINES (OWNED)
CAPACITY LIMIT
WITH INTEREST AT 15 PERCENT
0
1
2
3
4
5
6
CUSTOM COMBINING
ONE 7′ PTO COMBINE (OWNED)
CAPACITY LIMIT
ONE 12′ SP COMBINE (OWNED)
TWO 7′ PTO COMBINES (OWNED)
CAPACITY LIMIT
0
100
200
300
400
500
ACRES HARVESTED PER YEAR
U. S. DEPARTMENT OF AGRICULTURE
NEG. ERS 421-61 (8)
ECONOMIC RESEARCH SERVICE

Figure 3.

be drawn to separate the least-cost zone of the two alternative methods.

In the upper part of figure 3, the equal-cost line between custom combining and one 7-foot owned machine is the same as that in figure 2. Above about 235 acres, this line becomes the equal-cost line between custom combining and use of a 12-foot self-propelled machine. With a 5-percent interest rate, as used here, two 7-foot combines will be the least-cost method only at very low wage rates, and with acreages that exceed the capacity of one 7-foot machine.

The cost of a single 7-foot combine will be less than that of a 12-foot combine for any acreage, so the choice between the two will depend largely upon how many acres the farmer thinks he can cover with the smaller machine. But even this choice will probably not be entirely free of cost considerations. Higher labor rates will reduce the cost advantage of the 7-foot machine and thus reduce the temptation to try to "get by" with it on a larger acreage than is safe from the standpoint of timeliness.

Effect of a 15-Percent Interest Rate

In the foregoing analysis, a 5-percent interest rate was used throughout. But with capital rationing and competing uses for capital, the opportunity cost of capital may be considerably above the rate paid by farmers on borrowed funds.

The 15-percent interest rate, of course, enlarges the area of advantage of the alternatives involving the lesser investments relative to those with the greater investments (fig. 3, lower). Thus, it restricts the zone of a competitive advantage of the 12-foot self-propelled combine and expands that of custom combining. In fact, at the higher labor rates, custom combining becomes the least-cost alternative regardless of the acreage harvested.

The higher cost of capital may also reenforce the farm operator's inclination to try to "get by" with a 7-foot combine on more acres than he would otherwise attempt to handle. That is, it may push to the right our rather indefinite borderland between the 7-foot and 12-foot combines, but how much is not known.

Value of a Supplementary Table of Per Acre Costs

With only two alternatives, construction of the chart is simple. But with several alternatives, it can become confusing. It is worth while to arrange the data as shown in table 3, showing total per acre cost comparisons of the four methods for a number of combinations of acreages and labor rates. The lowest cost figure for each combination shown is boxed and approximate equal-cost lines are drawn in.

This combined table and chart also permits cost comparisons within the zone of advantage of each method. Thus, we can appraise the cost-penalty we would incur by choosing a method other than the least-cost one for the particular situation.

Other Potential Uses of This Method of Analysis

The method is flexible in that there is some choice as to which factors to vary and which to hold constant. For example, in the analysis above, the annual acreage and the wage rate are considered as variables and everything else is held constant for each chart. A chart showing the zones of competitive advantage of the alternatives for a *given* value per hour of labor and for a *range* of interest rates could just as easily have been drawn, but the interest rate does not seem to affect the zones of advantage to the same extent as the wage rate.

If in a particular situation, the interest rate, wage rate, and/or annual acreage can be considered as given, equal-cost values can be determined for some of the things here considered as fixed. For example, combine prices are often subject to a certain amount of bargaining, so attention might be directed to the maximum price a farmer can afford to pay for a particular combine rather than hire a custom machine.

In this instance, the original cost is considered a variable. This is one of the elements of fixed cost, and the algebra is considerably more involved. The following notation is used:

$\overline{V}_1$ = variable costs per acre of custom combining (i.e., the custom rate per acre);
F_2 = annual fixed cost of the owned combine (depreciation, interest, taxes, insurance and housing);
$\overline{F}_2$ = fixed cost per acre of the owned combine;
$\overline{V}_2$ = variable or operating costs per acre of the owned combine and tractor;
$\overline{L}_2$ = labor requirements in hours per acre with owned combine;

TABLE 3.—*Costs of 4 methods of combining for specified labor rates and acreages, Mississippi Delta, with interest at 5 percent*[1]

Value of labor and method	Acres harvested per year							
	50	100	150	200	250	300	350	400
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
$5 labor:								
Custom combining	$\boxed{5.50}$	$\boxed{5.50}$	$\boxed{5.50}$	$\boxed{5.50}$	$\boxed{5.50}$	$\boxed{5.50}$	$\boxed{5.50}$	$\boxed{5.50}$
One 7′ owned combine	11.83	9.33	8.50	8.08	8.01	-	-	-
Two 7′ owned combines	-	-	-	9.33	8.83	8.50	8.26	8.08
One 12′ owned combine	17.02	10.46	8.28	7.17	6.52	6.09	5.78	5.54
$4 labor:								
Custom combining	$\boxed{5.50}$	$\boxed{5.50}$	$\boxed{5.50}$	$\boxed{5.50}$	$\boxed{5.50}$	$\boxed{5.50}$	5.50	5.50
One 7′ owned combine	10.83	8.33	7.50	7.08	7.01	-	-	-
Two 7′ owned combines	-	-	-	8.33	7.83	7.50	7.26	7.08
One 12′ owned combine	16.52	9.96	7.78	6.67	6.02	5.59	$\boxed{5.28}$	$\boxed{5.04}$
$3 labor:								
Custom combining	$\boxed{5.50}$	$\boxed{5.50}$	$\boxed{5.50}$	$\boxed{5.50}$	$\boxed{5.50}$	5.50	5.50	5.50
One 7′ owned combine	9.83	7.33	6.50	6.08	6.01	-	-	-
Two 7′ owned combines	-	-	-	7.33	6.83	6.50	6.26	6.08
One 12′ owned combine	16.02	9.46	7.28	6.17	5.52	$\boxed{5.09}$	$\boxed{4.78}$	$\boxed{4.54}$
$2 labor:								
Custom combining	$\boxed{5.50}$	$\boxed{5.50}$	$\boxed{5.50}$	5.50	5.50	5.50	5.50	5.50
One 7′ owned combine	8.83	6.33	$\boxed{5.50}$	$\boxed{5.08}$	$\boxed{5.01}$	-	-	-
Two 7′ owned combines	-	-	-	6.33	5.83	5.50	5.26	5.08
One 12′ owned combine	15.52	8.96	6.78	5.67	5.02	$\boxed{4.59}$	$\boxed{4.28}$	$\boxed{4.04}$
$1 labor:								
Custom combining	$\boxed{5.50}$	5.50	5.50	5.50	5.50	5.50	5.50	5.50
One 7′ owned combine	7.83	$\boxed{5.33}$	$\boxed{4.50}$	$\boxed{4.08}$	$\boxed{4.01}$	-	-	-
Two 7′ owned combines	-	-	-	5.33	4.83	4.50	4.26	4.08
One 12′ owned combine	15.02	8.46	6.28	5.17	4.52	$\boxed{4.09}$	$\boxed{3.78}$	$\boxed{3.54}$

---

[1] □—indicates minimum cost. The curved line separates the 3 zones of cost advantage.

W = the value of labor per hour;
C_2 = original cost of the owned combine;
Y_2 = expected useful life of the owned combine, in years;
r = opportunity cost of capital, or the annual interest rate;
t = cost of taxes, insurance, and housing, as an annual rate; and
A = acres to be harvested per year.

The total fixed cost is the sum of annual depreciation ($0.9C_2/Y_2$), interest on investment ($\frac{C_2 r}{2}$), and taxes, insurance, and housing ($0.01\ C_2$). Thus

$$F_2=0.9C_2/Y_2+C_2r/2+0.01C_2$$

Therefore,

$$\bar{F}_2=\frac{0.9C_2/Y_2+C_2r/2+0.01C_2}{A}$$

The two cost functions are set equal to each other:

$$\begin{aligned}\bar{V}_1&=\bar{F}_2+\bar{V}_2+\bar{L}_2W\\&=\frac{0.9C_2/Y_2+C_2r/2+0.01C_2}{A}+\bar{V}_2+\bar{L}_2W\end{aligned}$$

Since the idea is to determine the break-even original cost, or what the farmer can afford to pay for a combine (with a given custom rate, interest rate, labor rate, acreage, and useful life), this equation is solved for C_2:

$$C_2=\frac{A(\bar{V}_1-\bar{V}_2-\bar{L}_2W)}{(0.9/Y_2+r/2+t)}$$

Again, while the expected useful life of a combine is arbitrarily set at 10 years in this analysis, the appropriate depreciation rate for a real-life situation is highly individual and subjective, and very difficult to determine. Thus it may be helpful, when other coefficients are known with greater certainty, to determine the number of years of use the owned combine would need to give to make it competitive with hiring a custom machine.

Using the same notation as above, the two cost functions are again set equal to each other. But this time the question involves the break-even number of years of useful life (with everything else given), so the equation is solved for Y_2, thus:

$$Y_2=\frac{0.9C_2}{[A(\bar{V}_1-\bar{V}_2-\bar{L}_2W)-C_2(r/2+t)]}$$

Although this discussion of the use of the suggested analytical procedure has been in terms of hiring vs. owning a combine, this analytical method can prove equally helpful in making sound choices involving a variety of other farm machines and other managerial decisions. Regardless of the particular problem to which this analytical method is applied, however, it enables the economic analyst to take into account more variables than does the conventional method. This means that, in any particular application, the suggested method facilitates the determination of a least-cost alternative over a wide variety of circumstances.

Governmental Problems on the Urban Fringe

By Frederick D. Stocker

Beset with many complex problems of its own, agriculture is perhaps entitled to the view that one which does not concern rural areas is metropolitan development and government. But the theme of this article is that metropolitan problems do concern agriculture. Urbanization, and in particular the massive movement of population into suburban communities and the open country beyond, do force many adjustments on rural communities. How rural people respond will not only govern the survival of agriculture in large areas of the Nation, but also will shape the urban landscape for generations to come. Nearly every large metropolis in recent years has undertaken studies of its growth trends and future prospects. They have tried to anticipate requirements for streets, schools, parks, water, sewers, and other public facilities. Economists, sociologists, and students of government have contributed studies, but with very few exceptions they take the viewpoint of the central city or the urban portions of the metropolitan area, and focus on policy issues in the city and the suburb. Students have largely ignored the effect of urban expansion on surrounding rural areas and policy questions that face these communities. This article considers some of the ways in which urbanization bears on agriculture and rural communities, and attempts to identify policy choices open to local government in or near metropolitan areas. By implication, the author raises some questions on which research is needed to enable rural communities to make decisions that will serve their own interest and that of the growing urban centers.

THE IMPACT of urbanization on agriculture is most obvious at the point where farmland actually goes under the bulldozer. In recent years, requirements for building lots, shopping centers, and new industrial locations, plus the roads, parks, and other public land uses that go along with urbanization, have been taking annually some 1½ million acres of rural land, about a third of which is cropland. This rate may be expected to increase rather than diminish in the next 15 to 20 years.

Urbanization frequently takes the best land out of production because the same qualities of topography, drainage, and location that make land suitable to agricultural production are attractive to urban real estate developers. Some farmland lost to urban uses probably is literally irreplaceable, as in the case of fruit- and nut-producing areas around San Francisco.

Perhaps even more significant than the physical changes in land is the economic impact of urbanization on agriculture. This includes the disruptive effects that spread out far beyond the urban area into what may be called a zone of economic influence. This zone may cover hundreds, even thousands, of square miles of open country around a large city. For every acre of farmland that actually goes under the bulldozer, many more are affected by the change in economic circumstances. Especially is this true when development occurs in leapfrog fashion, passing over much land not physically changed but harmfully affected for agricultural operations by economic change.

Urban expansion sets in motion several kinds of economic change. For one, it leads to a bidding up of land values. Sometimes the rise is associated with the immediate prospect of conversion of the land to nonfarm uses. More often, prospective change in land use is remote, and the motive for buying farmland is speculative, arising from the prospect of selling it later at a higher price. Land market studies in metropolitan areas reveal that upward price pressures often extend far beyond the reach of any foreseeable urban expansion. These pressures have been one element in the strong uptrend in land values evident during most of the last decade.[1]

Urbanization also creates new problems for local government in the surrounding rural areas. The spread of population generates a demand for new and improved public services—schools, police and fire protection, water, and sewers. Increased traffic necessitates new roads and improvement in existing highways. Population growth underscores the need for building and sanitation codes, land use regulations, and long-range planning. In short, the rural portions of growing metropolitan areas are obliged to abandon the simple forms of rural government and, often almost overnight, to take on many of the attributes of modern city government.

To do this, of course, is not easy—and it is costly. Strain is placed on local community leadership and on local tax resources. Demands for a variety of public services that are costlier and of higher quality than those of the past join with rising farmland values to put a steadily growing tax burden on agriculture. Farms in counties in standard metropolitan statistical areas in recent years have borne a taxload almost double the assessments on farms in adjacent counties outside the zone of metropolitan influence, and taxes on farms in metropolitan areas are growing almost twice as fast as those outside.[2]

Policy Alternatives

Rising farmland prices, enlarged demands on local government, and higher taxes are only a few of the repercussions of urban expansion. Only a sketchy understanding of their true nature and causes is possible, to say nothing of their consequences for agriculture and rural people. Yet enough can be seen to recognize certain dangers in many present policies, and to indicate policy alternatives that hold promise.

One type of reaction of rural people to impending urban growth seems to be a futile attempt to turn it back. This motive often seems to lie behind such measures as incorporation of agricultural "cities," restrictive covenants among landowners who agree not to sell land to developers, and excessive reliance on exclusive agricultural zoning.

Urban expansion is in fact one of the technological imperatives of our time. The phenomenal growth in agricultural productivity has itself had much to do with urbanization in our society. Our past economic and industrial development made large cities necessary. Continued economic growth will unquestionably require still larger urban areas. When rural areas adopt policies toward urban growth, too often they try, unilaterally, to keep development out. The fallacy in such measures lies in the apparent assumption that more and more millions of poeple have clustered together in urban areas without good reason.

More common, though equally unrealistic, is the view that regards urban expansion exclusively in terms of opportunities for capital gains in the land market. Owners of land for miles around any growing city can, with little difficulty, visualize their tracts of farmland as sites for residential subdivisions or industrial plants. Local governmental action to plan or control the use of land, they feel, can only harm their prospects for profit. To the extent that they are able to influence local policy, therefore, they block efforts at regional planning or zoning.

Seldom fully appreciated is the fact that almost every city has within easy reach more land than it can utilize for a long time to come.[3] Unplanned growth may bring large gains to a few fortunate landowners, but it leaves many others disappointed. Worse, it tends to destroy the opportunity for continued economic use of land in agriculture, as well as the desirability of the area as a residential suburb. Large areas, to quote one student of the problem, are "effectively sterilized by premature sprinklings of miscellaneous suburban false starts and separate speculative landholdings."[4]

---

[1] Forces that bear on the values of farmland in metropolitan areas are discussed in Current Developments in the Farm Real Estate Market, U.S. Econ. Res. Serv. CD 52, May 1959, p. 15, and CD 58, May 1961, pp. 13–15.

[2] Farm Real Estate Taxes: Recent Trends and Developments, U.S. Agr. Res. Serv. RET–1, June 1961.

[3] Solberg, Erling D., The Why and How of Rural Zoning, U.S. Dept. Agr., Agr. Inform. Bul. 196, Dec. 1958, pp. 31–33.

Urban expansion in some places has been met with a policy of trying to stop it and in others with a policy of unfettered exploitation; but it appears that too often, the response of rural people to problems arising from urbanization has been to ignore them. Perhaps this attitude is adopted deliberately, on the principle that if you pay no attention to a problem it may go away. It may result from failure or unwillingness to recognize problems, even those that are most imminent. Or rural people may recognize problems but feel that they are powerless to do anything about them.

Fragmentary evidence available on the failure of rural people to perceive emerging problems of urbanization and to deal realistically with them is not encouraging. Preliminary findings of one study indicated that of all groups in the selected community surveyed, full-time farmers were least aware of the advancing urban fringe and of the kinds of changes urbanization would bring. This lack of awareness was the more surprising in view of the fact that the particular community studied lies close to a large and growing metropolitan center, and, as was widely known, locally contained within its boundaries two interchanges for an arterial highway soon to be built.

The same study indicated that these full-time farmers exert influence over local policy out of proportion to their numbers. Under the circumstances, it is hard to be optimistic over the ability of such a rural community to deal wisely and successfully with the problems that will soon be upon it.

Whatever the reason for apathy, whether lack of recognition of well-marked trends and their probable consequences, or a deliberate decision not to become involved in what are regarded as other people's problems, it seems clear that agriculture and rural people in general can ill afford to ignore the process of urbanization. The problems are not other people's; they are everybody's.

It is often said that there are no longer any urban problems in our metropolitan areas, but only metropolitan problems. Past experience shows that, economically and socially, metropolitan centers and the surrounding areas are becoming more and more closely integrated. A milkshed from which a metropolitan area draws its milk supply may extend over hundreds of square miles, and water may be obtained from distant sources. Adjuncts to urban living such as water reservoirs, airports, golf courses, regional parks, and industrial parks typically lie in rural areas.

In modern society, decisions taken by cities necessarily have an impact on the outlying rural communities. The reverse is equally true. If rural areas ignore problems created by metropolitan expansion, or if in effect they adopt a policy of no policy, the results are likely to be unsatisfactory to all concerned.

Toward More Effective Local Government

If this appraisal is valid, it follows that prevailing attitudes and policies of rural communities toward urban expansion often may not serve the long-range welfare either of the inhabitants of growing urban areas or of rural people themselves. The alternative, if metropolitan problems are to be dealt with successfully, is for rural people to involve themselves positively and constructively in governmental policy questions of regionwide significance.

Perhaps one way in which agriculture can contribute to the solution of problems of urbanization, at the same time protecting legitimate rural interests, is to join in working toward more viable government in metropolitan areas. The complex and inefficient structure of local government is common knowledge. What is not recognized is the degree to which rural people share responsibility for the situation. Observation suggests that the inhabitants of rural areas around growing urban centers have generally acquiesced in, even actually encouraged, the incorporation of new residential communities. Rural people frequently have been unwilling or, under limitations of State law, unable through county government to provide urban-type services to these new developments. Under such conditions, communities that wanted urban-type services have in effect been told to work them out for themselves.

---

[4] Mason Gaffney, "Comments on Clawson's Suburban Development Districts," Jour. Amer. Inst. Planners, Vol. 27(1): 79, Feb. 1961.

This policy of disengagement may cause rural people to lose any voice in decisions of areawide significance, and may result in urban areas pushing off their problems on relatively defenseless rural people. Disposal of sewage wastes and relocation of displaced persons owing to slum clearance and urban renewal are examples of city problems often exported into the country, where weak rural governments are ill-equipped to deal with them.[5] Worst of all, an unwillingness of rural people to become involved in metropolitan problems creates a legacy for the future in terms of poorly planned (or unplanned) development, inefficient and uneven levels of governmental services, and a fragmented and unproductive local tax base.

Instead of following a policy of disengagement from problems of areawide significance, farmers and other rural members of the community would do well to face involvement as inevitable and take steps to make the most of it. This means working toward governmental arrangements that recognize the interrelated nature of all parts of the metropolitan region and deal with common problems—public transportation, water and sewage, planing, and others—on a regionwide base.

Such an approach is in line with recent recommendations of the Committee for Economic Development in its report entitled "Guiding Metropolitan Growth." In a major recommendation, CED calls for the "modernizing of governmental structures in metroplitan areas so as to enable them to carry out more efficiently and effectively those public responsibilities which are clearly metropolitan in scope."

Noting specifically the need for a metropolitan approach to the provision of open space for future development and recreational needs, as well as to problems of transportation, air pollution and the like, the CED report continues: "These matters cannot be tackled by small local jurisdictions. A metropolitan level of government could cope with these matters without sacrificing local control."[6]

Among governmental activities that have areawide significance, none has greater import to agriculture than land-use controls. The specifics of these controls need not be set forth in detail here. It is worth noting, however, that success in planning and zoning depends on wholehearted support from the community. When support is not given or is not strong enough to block the concentrated efforts of those who seek special exceptions, the program fails. Farm groups may be listed among those who have often failed to appreciate the advantages to agriculture in controls to head off speculation in undeveloped lands. Thus the ruinous effects that such speculation has on farming throughout a wide zone around an urban center are not foreseen.

The preservation of agriculture around our growing cities depends on effective control of the pace and direction of residential, commercial, and industrial expansion. Regional planning bodies are the means to such controls. Zoning is one of the chief tools. Rural groups would do well to support the principle of land-use planning both to their own advantage and to that of the community at large.

Tax Problems for Farmers

Urban expansion gives rise to fiscal problems for local governments in surrounding rural and semirural areas, and tax problems for farmers and their neighbors. The problem is how to finance the new and expanded public services that a growing population requires. Many a small rural school district, operating a one-room grade school, has come face to face with this problem when a builder comes in and puts up several hundred low-price homes on what hitherto has been farmland. How are the new schools to be paid for? State aid doubtless has a role. Nevertheless, most of the load rests still on the property tax.

The property tax problem has in fact become acute in areas where urban influences spread into the surrounding countryside, raising governmental costs and pushing the price of farmland far above values that can be supported in farming. The resulting tax pressures often force farmers either to sell their land to a speculator or developer or else in effect to become speculators themselves. A farmer in this position needs to keep an eye on his farming operations and at the same time to be always alert for a chance of selling his farm advantageously. Effective planning helps to minimize speculation in fringe-area farmland and thus enable a farmer to keep his mind on his farm business.

---

[5] This point is developed by C. J. Hein in "Metropolitan Government—Residents Outside the Central Urban Areas," Western Political Quarterly, September 1961.

[6] Guiding Metropolitan Growth, a Statement on National Policy by the Research and Policy Committee of the Committee for Economic Development, August 1960, p. 9.

Several States deal with the problem of excessively burdensome taxation through laws designed to hold down assessments of farmland in rural-urban fringes. Maryland and a few other States now require land used for agriculture to be assessed for taxation on the basis of its agricultural value alone, without regard to other factors that may influence its selling price. Research on the effects of such a law indicates that substantial benefits result for individual property owners. But when these laws are conceived exclusively as a form of tax relief to owners of farmland, without regard to the interest of the community at large, their rationale is weak and their effectiveness questionable.[7]

There may well be a place in a well-ordered property tax system for preferential taxation of farmland, but its workability, like that of any system of regional planning, depends upon its enforcement on an areawide basis to serve the needs of the entire community. This is possible only if farmers and other rural people involve themselves in an active way in governmental decisions that affect metropolitan areas.

Rural areas can exercise a voice in metropolitan area problems through various arrangements. Some involve formal reorganization of existing governments. Among these are the urban county plan, city-county consolidation, organization of multipurpose metropolitan districts, and metropolitan federation. A new proposal calls for establishment of suburban development districts having wide powers in new development areas.[8] Less thoroughgoing reorganizations, involving formal or informal cooperation of representatives of existing local jurisdictions, also are possible.[9] We need to examine the experimentation that is taking place in various forms of metropolitan government. Close study of the growing body of experience would reveal the merits and weaknesses of each from the standpoint of the rural areas involved.

Some form of areawide governmental machinery will certainly produce better results for agriculture and for urban people than does the present system, with its powers of decision making scattered and its tax base fragmented. A policy of disengagement cannot serve the long-run advantages of inhabitants of either the rural or the urban portions of metropolitan areas. Governmental decisions of areawide significance are being made and will continue to be made in every growing metropolitan area. Establishment of some system whereby rural areas can participate in these decisions is vital to the welfare of the entire community, especially to its agricultural segments.

---

[7] House, P. W., Preferential Assessment of Farmland in the Rural-Urban Fringe of Maryland, U.S. Econ. Res. Serv., ERS-8, 20 pp., illus. June 1961; and State Action Relating to Taxation of Farmland on the Rural-Urban Fringe, ERS-13, 23 pp., August 1961.

[8] Clawson, M. W., "Suburban Development Districts," Jour. Amer. Inst. Planners, 26(2) : 69-83. May 1960.

[9] The major alternatives are summarized and compared by C. J. Hein, in "The Stake of Rural Residents in Metropolitan Government," U.S. Econ. Res. Serv. Misc. Pub. 869, July 1961.

Rural Problem Areas Need Better Schools

By William S. Folkman

Education of the youth is recognized by workers in rural development as one of the most hopeful means of achieving satisfactory adjustment in low-income rural areas. Some writers have concluded that inadequacies in this regard represent one of the major causes for the persistence of problems in low-income areas. It is relatively easy to ascertain the quantity *of education received by rural youths in low-income rural areas, that is, at 10-year intervals, when census data are available. But it is more difficult to ascertain the* quality *of education available to low-income rural youth. While factors for which data are available do not directly measure quality of education, it is generally conceded that in our commercially oriented society, there is a rather close relationship between expenditures for school operation and level of education provided. This report brings together and consolidates the information available for the nine generalized problem areas delineated in the Department's report to the President. It is hoped that this will aid workers in rural development to evaluate their own local school situations more effectively. The report is intended also to help them recognize more fully the necessity for improving educational opportunities as an element in community programs.*

FARM PEOPLE in low-income areas in the United States have lower-than-average educational facilities, according to various studies and compilations of data examined for this analysis. U.S. Department of Agriculture report, *Development of Agriculture's Human Resources*,[1] shows that education among farm people 25 years of age and over in 1950 was below average in low-income areas. While other farm people in the Nation averaged over 8½ years of school completed, and more than 1 in 4 was a high school graduate, farm people in problem areas averaged little better than 7 years of schooling and only slightly more than 1 in 10 was a high school graduate (fig. 1).

There was considerable variation among the generalized areas (table 1). The average number of years of schooling completed ranges from 5.5 in the Mississippi Delta to 9.0 in the Cascade and Rocky Mountain areas. In the Delta, nearly 3 in 4 had completed fewer than 8 years of schooling. In the Mountain area, only 1 in 5 had had so little schooling.

In educational achievement, the farm population generally has lagged behind the rest of the population. The average number of years of schooling completed in 1950 by the total U.S. population in this age group was 9.3. Only one State—South Carolina—had as low an average as that of the combined figure for the low-income areas (7.6). At the other extreme, the population of Utah had an average of 12.0 years of school completed.

Table 1 shows that the educational accomplishment of the adult rural-farm population in those areas classified as serious and substantial problem areas is considerably less than such accomplishment in those considered moderate problem areas. The difference between serious and substantial areas, however, was not large.

The proportion of pupils who discontinue school attendance before graduating from high school is distressingly high. Although, unfortunately, current data are not available to permit a separate examination of the situation among the young people in low-income rural areas, the situation is generally conceded to be worse in these areas.

However, a student need not drop out of school permanently for his education to suffer. Excessive absenteeism also has a disruptive effect on the educational process. The relationship of average daily attendance (ADA[2]) to enrollment provides an indicator of the prevalence of this condition. Table 2 shows that some of the low-income areas fall considerably below the average for all rural counties as well as the national average. By this measure, the Mississippi Delta and Cascade and Rocky Mountain areas have the lowest figures. Portions of the areas in which the

---

[1] *Development of Agriculture's Human Resources.* A Report on Problems of Low-Income Farmers. Prepared for the Secretary of Agriculture. U.S. Department of Agriculture. April 1955.

[2] The ADA for a given school is the sum of the days present of all pupils when school was actually in session, divided by the number of days school was actually in session.

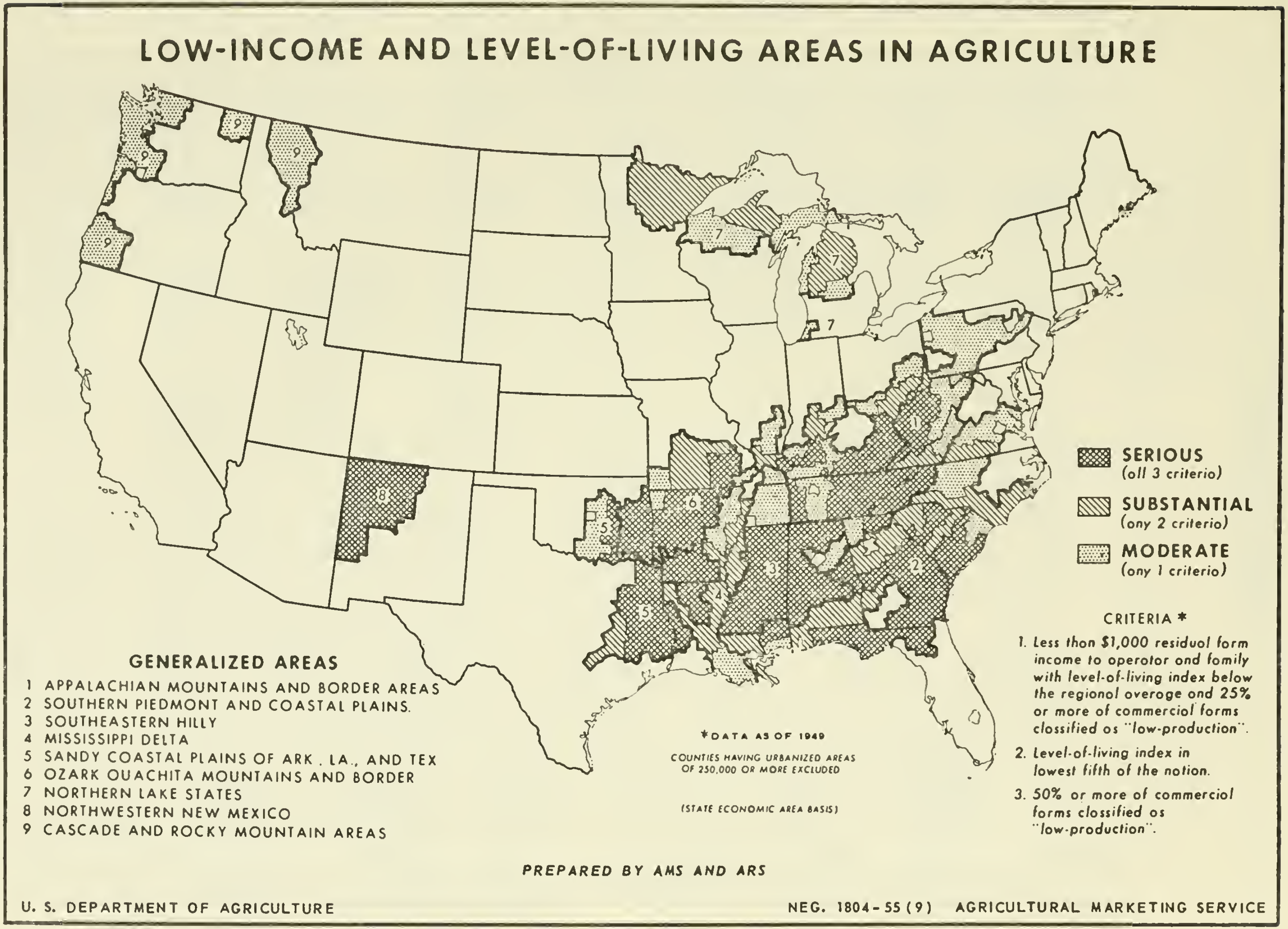
LOW-INCOME AND LEVEL-OF-LIVING AREAS IN AGRICULTURE
1
2
3
4
5
5
6
7
7
7
8
9
9
9
9
SERIOUS
(all 3 criteria)
SUBSTANTIAL
(any 2 criteria)
MODERATE
(any 1 criteria)
CRITERIA *
1. Less than $1,000 residual farm income to operator and family with level-of-living index below the regional average and 25% or more of commercial farms classified as "low-production".
2. Level-of-living index in lowest fifth of the nation.
3. 50% or more of commercial farms classified as "low-production".
GENERALIZED AREAS
1 APPALACHIAN MOUNTAINS AND BORDER AREAS
2 SOUTHERN PIEDMONT AND COASTAL PLAINS.
3 SOUTHEASTERN HILLY
4 MISSISSIPPI DELTA
5 SANDY COASTAL PLAINS OF ARK. LA., AND TEX
6 OZARK OUACHITA MOUNTAINS AND BORDER
7 NORTHERN LAKE STATES
8 NORTHWESTERN NEW MEXICO
9 CASCADE AND ROCKY MOUNTAIN AREAS
*DATA AS OF 1949
COUNTIES HAVING URBANIZED AREAS OF 250,000 OR MORE EXCLUDED
(STATE ECONOMIC AREA BASIS)
PREPARED BY AMS AND ARS
U. S. DEPARTMENT OF AGRICULTURE
NEG. 1804-55 (9)
AGRICULTURAL MARKETING SERVICE

Figure 1.

TABLE 1.—*Educational attainment of the rural-farm population, 25 years of age and over, in low-income problem areas, 1950*

Generalized area	Unit	Problem areas classified as			
		Moderate	Substantial	Serious	Average
Applachian Mountains and border areas:					
Percentage completing:					
Less than 8 years	Pct.	39. 8	43. 6	59. 3	49. 4
8 years but not high school	Pct.	43. 7	41. 8	31. 8	37. 9
High school and/or more	Pct.	16. 5	14. 6	8. 9	12. 7
Total	Pct.	100. 0	100. 0	100. 0	100. 0
Median years of school-completed	No.	8. 3	8. 2	7. 3	8. 0
Southern Piedmont and Coastal Plains:					
Percentage completing:					
Less than 8 years	Pct.	65. 1	65. 6	67. 0	65. 9
8 years but not high school	Pct.	24. 4	25. 4	24. 1	24. 8
High school and/or more	Pct.	10. 5	9. 0	8. 9	9. 3
Total	Pct.	100. 0	100. 0	100. 0	100. 0
Median years of school completed	No.	7. 1	6. 9	6. 4	6. 8
Southeastern hilly:					
Percentage completing:					
Less than 8 years	Pct.	51. 8	----------	60. 5	58. 7
8 years but not high school	Pct.	37. 9	----------	29. 2	31. 0
High school and/or more	Pct.	10. 3	----------	10. 3	10. 3
Total	Pct.	100. 0	----------	100. 0	100. 0
Median years of school completed	No.	7. 8	----------	7. 0	7. 2
Mississippi Delta:					
Percentage completing:					
Less than 8 years	Pct.	64. 4	71. 1	----------	73. 4
8 years but not high school	Pct.	27. 6	17. 0	----------	20. 1
High school and/or more	Pct.	8. 0	5. 9	----------	6. 5
Total	Pct.	100. 0	100. 0	----------	100. 0
Median years of school completed	No.	6. 6	5. 1	----------	5. 5
Sandy Coastal Plains, Southwestern:					
Percentage completing:					
Less than 8 years	Pct.	40. 5	61. 9	54. 3	53. 1
8 years but not high school	do	42. 7	30. 2	35. 0	35. 6
High school and/or more	do	17. 0	7. 9	10. 7	11. 3
Total	do	100. 0	100. 0	100. 0	100. 0
Median years of school completed	No.	8. 3	7. 1	7. 7	7. 8
Ozark-Ouachita Mountains and border:					
Percentage completing:					
Less than 8 years	Pct.	29. 4	33. 3	48. 3	41. 7
8 years but not high school	do	50. 8	51. 4	40. 8	45. 0
High school and/or more	do	19. 8	15. 3	10. 9	13. 3
Total	do	100. 0	100. 0	100. 0	100. 0
Median years of school completed	No.	8. 6	8. 4	8. 1	8. 3
Northern Lake States:					
Percentage completing:					
Less than 8 years	Pct.	29. 8	33. 7	----------	31. 5
8 years but not high school	do	50. 8	49. 3	----------	50. 1
High school and/or more	do	19. 4	17. 0	----------	18. 4
Total	do	100. 0	100. 0	----------	100. 0
Median years of school completed	No.	8. 5	8. 4	----------	8. 5
Northwestern New Mexico:					
Percentage completing:					
Less than 8 years	Pct.	----------	----------	60. 5	60. 5
8 years but not high school	do	----------	----------	24. 1	24. 1
High school and/or more	do	----------	----------	15. 4	15. 4
Total	do	----------	----------	100. 0	100. 0
Median years of school completed	No.	----------	----------	6. 4	6. 4

TABLE 1.—*Educational attainment of the rural-farm population, 25 years of age and over, in low-income problem areas, 1950*—Continued

Generalized area	Unit	Problem areas classified as			
		Moderate	Substantial	Serious	Average
Cascade and Rocky Mountain areas:					
Percentage completing:					
Less than 8 years	Pct	20. 3			20. 3
8 years but not high school	Pct	48. 5			48. 5
High school and/or more	Pct	31. 2			31. 2
Total	Pct	100. 0			100. 0
Median years of school completed	No	9. 0			9. 0
Problem areas, total:					
Percentage completing:					
Less than 8 years	Pct	45. 3	60. 0	59. 3	55. 1
8 years but not high school	Pct	26. 4	29. 8	31. 0	33. 3
High school and/or more	Pct	28. 3	10. 2	9. 7	11. 6
Total	Pct	100. 0	100. 0	100. 0	100. 0
Median years of school completed	No	8. 2	7. 2	7. 2	7. 6
Remainder of U.S. rural-farm:					
Percentage completing:					
Less than 8 years	Pct				27. 4
8 years but not high school	Pct				46. 2
High school and/or more	Pct				26. 4
Total	Pct				100. 0
Median years of school completed	No				8. 7
U.S. total:					
Percentage completing:					
Less than 8 years	Pct				27. 5
8 years but not high school	Pct				38. 2
High school and/or more	Pct				34. 3
Total	Pct				100. 0
Median years of school completed	No				9. 3

Compiled from U.S. Census of Population, 1950.

low-income problem was of "moderate" severity, on the average, showed up more favorably than did those in which the problem was more serious.

Quality of Education

Although an occasional well-qualified and dedicated teacher continues to serve without regard for salary, generally there is a continual loss of teachers from districts that offer low pay to better paying districts and occupations. The quality of recruits to the profession also suffers. All of this, of course, affects the quality of education. Thus, the scale of teachers' salaries provides a rather effective measure of the level of education maintained in a given area.

The Census of Governments provides data from which teachers' salaries for 1957 can be computed. The average monthly salary paid full-time teachers in the nine generalized problem areas in April 1957 was $329. This compares with an average for the whole country of $406. The average April salary paid full-time teachers in California, the highest State, was $510. The lowest average salary of any State that year was Arkansas; it was $255. The average among the areas varies from a low of $280 in the Southeastern hilly area to the high averages of $394 in the Northwestern New Mexico area and $392 for the Northern Lake State areas (table 3).

The data for the rest of the analysis are taken primarily from the Biennial Survey of Education in the United States, 1954–56, but unfortunately separate data for all counties that make up the nine generalized problem areas are not available. Rural schools that were *not* part of a county-unit school system or were not in a rural county [3] were

---

[3] The Office of Education used the following criteria to identify counties as rural. To be selected, (1) 60 percent or more of the total population of the county had to be rural, i.e., live outside centers of 2,500 or more; (2) in any county with only between 60 and 85 percent of its population reported as rural, at least half of the rural population had to live on farms.

TABLE 2.—*Average daily attendance as percentage of enrollment in low-income problem areas, 1955–56*

Generalized area	Problem areas classified as—			
	Moderate	Substantial	Serious	Average
	Percent	*Percent*	*Percent*	*Percent*
Appalachian Mountains and Border areas	90. 0	90. 3	88. 2	89. 0
Southern Piedmont and Coastal Plains	87. 8	86. 4	83. 0	85. 2
Southeastern hilly	90. 1		84. 3	85. 4
Mississippi Delta	86. 4	82. 1		83. 5
Sandy Coastal Plains, Southwestern	91. 4	86. 4	89. 7	89. 5
Ozark-Ouachita Mountains and border	85. 4	85. 2	87. 8	86. 8
Northern Lake States	91. 1	88. 9		89. 9
Northwestern New Mexico			88. 0	88. 0
Cascade and Rocky Mountain areas	84. 5			84. 5
Problem areas, total	88. 7	85. 8	86. 1	86. 6
All rural counties				87. 4
U.S. total				89. 0

Compiled from Biennial Survey of Education in the United States, 1954–56, Ch. 3, secs. III and IV.

not reported separately. Of the 1,209 counties included in the low-income delineation, data were available for 926, or 77 percent. Data were available for a higher proportion of the counties designated as "serious" than for those classified as "moderate" problem areas—85 percent for the serious counties, 60 percent for the moderate ones. Eighty percent of the counties in the "substantial" category were included. This shows how rural location, or the absence of urban centers, relates to the low-income problem. The main point to be remembered, however, is that in the ensuing presentation the most seriously affected counties are overrepresented.

Size of School

The size of a school has a bearing on a variety of its aspects. It affects the diversity of the program that can be offered, and the cost per pupil is related to size of enrollment. The character of the relationship a pupil has with the school and its personnel is affected also. Large schools present one set of advantages and problems, small ones a different set, and within certain broad limits, one cannot say with finality which is better. Considering the maturity level of the pupils, many of our elementary schools are probably too large. On the other hand, Conant [4] has indicated that many of our high schools are too small to be able to provide an adequate program. His contention is that a graduating class of at least 100 is necessary to support such a program—this criterion is rapidly becoming accepted as a yardstick.

Rural schools are often pictured in the popular mind as one-room, one-teacher affairs. However accurate this may have been at one time, it is hardly a valid characterization of most rural areas today. Reorganization of school districts and consolidation have brought about widespread changes. The average 1955–56 per-school enrollment of elementary and secondary pupils among the 1,760 rural counties in the United States was 120. The average enrollment for the 926 counties in the generalized problem areas was 166 (table 4). Only the Northern Lake States and the Ozark-Ouachita Mountains and border areas had enrollments below the national average of the rural counties.

The smallness of schools in terms of enrollment is not so much a problem in the Southeast, the area in which most low-income counties are located, as it is in the sparsely populated sections of the Great Plains. In Nebraska, North Dakota, and South Dakota, for example, the average rural school enrollment was about 30 pupils. However, schools in the "serious" counties were considerably smaller than those in the "moderate" counties. Counties where the problem was classified as "substantial" fell into an intermediate position.

We have seen that the average school in the problem areas was considerably larger than the average for all rural counties, but the average enrollment per school for *all* public schools in the

---

[4] Conant, J. B. *The American High School Today.* McGraw-Hill Book Co., New York. 1959.

TABLE 3.—*Average April salary of full-time teachers in low-income problem areas, 1957*

Generalized area	Problem areas classified as—			
	Moderate	Substantial	Serious	Average
	Dollars	*Dollars*	*Dollars*	*Dollars*
Appalachian Mountains and Border areas	346	357	313	333
Southern Piedmont and Coastal Plains	330	326	290	314
Southeastern hilly	277	----------	281	280
Mississippi Delta	341	362	----------	355
Sandy Coastal Plains, Southwestern	353	321	341	342
Ozark-Ouachita Mountains and border	292	300	296	296
Northern Lake States	388	395	----------	392
Northwestern New Mexico	----------	----------	394	394
Cascade and Rocky Mountain areas	386	----------	----------	386
Problem areas, total	346	343	306	329
U.S. total	----------	----------	----------	406

Compiled from 1957 Census of Government, vol. 2, No. 1.

Nation was 239. To provide wider perspective, a comparision might be made with urban schools. The smallest city group—population 2,500 to 9,999—had an average enrollment per school of 354. For cities of 25,000 or more, the average was 685.

The size of staff is another related aspect of school quality. A wide variety of courses and services is needed to provide a modern educational program. The necessary talents and skills are less likely to be provided by a small staff, and problems of scheduling are greater. The variation among the generalized areas is rather large; staffs range from 4.5 teachers per school in the Ozark-Ouachita Mountains and border areas to 9.8 in the Southern Piedmont and Coastal Plains area (table 5), which is also the average number of teachers per school for the country as a whole. By degree of seriousness of the low-income problem, the most serious counties, on the average, have a smaller teacher-school ratio; those with a "moderate" problem have a larger ratio.

In many schools in the Plains and Rocky Mountain States, the small number of pupils per teacher produces a serious problem of high per-pupil costs and of restricted programs of instruction. This problem is less serious in areas designated low income. With the typical pattern of settlement found in the South, the density of population is generally such as to provide a sizable school-age population within a given area, provided local school districts are not inordinately small. The average daily attendance (ADA) of 23.5 pupils per teacher is fairly close to the U.S. average of 21.8 (table 6). In general, it would seem that the pupil-teacher ratio does not represent as great a problem for the low-income rural areas as it does for the areas of sparse rural population. Hidden by these averages, however, are undoubtedly some individual schools located in areas where outmigration has resulted in ratios of pupils to teachers that are inefficiently low. In other schools, teachers are probably attempting to cope with excessively large classes. The standards often cited suggest 30 pupils per teacher in the elementary grades and 25 in the secondary grades.

Expenditures for Education

As indicated earlier, a close relationship exists between amount spent for education and quality of the service provided. Measures of expenditure per pupil, more than most other measures, reveal the weakness of schools in the low-income areas. Current expenses for the U.S. average $294 per pupil in ADA (table 7). This is almost $50 more per pupil than that expended in the rural counties, and more than $100 greater than the average expenditures in low-income counties. Expenses per pupil for instruction (table 8) follow a similar pattern. The amount expended per pupil generally varies inversely with the degree of severity of the low-income problem. Table 8 also shows considerable variation from one area to another. These differences are partly explained by differences in such factors as size of school, pupil-teacher ratio, and so forth, previously discussed. In many of the biracial counties, the relatively small tax income available for the schools is

TABLE 4.—*Enrollment per school in low-income problem areas, 1955–56*

Generalized area	Problem areas classified as—			
	Moderate	Substantial	Serious	Average
	Pupils	*Pupils*	*Pupils*	*Pupils*
Appalachian Mountains and Border areas	212	160	125	154
Southern Piedmont and Coastal Plains	374	252	264	278
Southeastern hilly	158		155	155
Mississippi Delta	282	239		253
Sandy Coastal Plains, Southwestern	89	132	162	149
Ozark-Ouachita Mountains and border	141	94	123	116
Northern Lake States	113	114		113
Northwestern New Mexico			131	131
Cascade and Rocky Mountain areas	176			176
Problem areas, total	194	175	149	166
All rural counties				120
U.S. total				239

Compiled from Biennial Survey of Education in the United States, 1954–56. Ch. 3, secs. III and IV.

TABLE 5.—*Teacher-school ratio in low-income problem areas, 1955–56*

Generalized area	Problem areas classified as—			
	Moderate	Substantial	Serious	Average
Appalachian Mountains and border areas	8. 4	6. 1	4. 5	5. 8
Southern Piedmont and Coastal Plains	13. 3	8. 7	9. 4	9. 8
Southeastern hilly	5. 7		5. 3	5. 3
Mississippi Delta	9. 1	6. 8		7. 5
Sandy Coastal Plains, Southwestern	4. 2	6. 1	7. 1	6. 6
Ozark-Ouachita Mountains and border	5. 5	3. 7	4. 7	4. 5
Northern Lake States	5. 0	5. 0		5. 0
Northwestern New Mexico			6. 0	6. 0
Cascade and Rocky Mountain areas	8. 3			8. 3
Problem areas, total	7. 5	6. 2	5. 5	6. 1
U.S. total				9. 8

Compiled from Biennial Survey of Education in the United States, 1954–56. Ch. 3, secs. III and IV, and 1957 Census of Government, vol. 2, No. 1.

TABLE 6.—*Pupil-teacher ratio (ADA) in low-income problem areas, 1955–56*

Generalized area	Problem areas classified as—			
	Moderate	Substantial	Serious	Average
Appalachian Mountains and Border areas	23. 2	24. 8	24. 6	24. 2
Southern Piedmont and Coastal Plains	26. 0	23. 9	22. 4	23. 6
Southeastern hilly	25. 1		24. 3	24. 4
Mississippi Delta	24. 8	24. 3		24. 4
Sandy Coastal Plains, Southwestern	19. 5	18. 8	20. 7	20. 5
Ozark-Ouachita Mountains and border	21. 8	21. 9	23. 0	22. 6
Northern Lake States	20. 6	20. 5		20. 5
Northwestern New Mexico			21. 8	21. 8
Cascade and Rocky Mountain areas	18. 1			18. 1
Problem areas, total	23. 6	23. 7	23. 3	23. 5
U.S. total				21. 8

Compiled from Bienial Survey of Education in the United States, 1954–56. Ch. 3, sec. III and IV, and 1957 Census of Government, vol. 2, No. 1.

TABLE 7.—*Annual expense for instruction per pupil in ADA in low-income problem areas, 1955–56* [1]

Generalized area	Problem areas classified as—			
	Moderate	Substantial	Serious	Average
	Dollars	*Dollars*	*Dollars*	*Dollars*
Appalachian Mountains and Border areas	139	139	110	122
Southern Piedmont and Coastal Plains	129	134	140	136
Southeastern hilly	110	----------	113	112
Mississippi Delta	117	131	----------	126
Sandy Coastal Plains, Southwestern	176	198	172	174
Ozark-Ouachita Mountains and border	129	131	121	124
Northern Lake States	185	189	----------	187
Northwestern New Mexico	----------	----------	209	209
Cascade and Rocky Mountain areas	233	----------	----------	233
Problem areas, total	137	138	128	133
All rural counties	----------	----------	----------	160
U.S. total	----------	----------	----------	198

[1] Includes expenditures for supplies, free textbooks, libraries, and other isntructional expense in addition to amounts used for salaries and wages of classroom teachers, supervisors and principals, librarians, guidance personnel, and other instructional staff. It does not include operation and maintenance, transportation, or other sshool services.

Compiled from Biennial Survey of Education in the United States, 1954–56. Ch. 3, Secs. III and IV.

TABLE 8.—*Total annual current expenses per pupil in ADA in low-income problem areas, 1955–56*

Generalized area	Problem areas classified as—			
	Moderate	Substantial	Serious	Average
	Dollars	*Dollars*	*Dollars*	*Dollars*
Appalachian Mountains and Border areas	203	210	153	175
Southern Piedmont and Coastal Plains	171	180	186	181
Southeastern hilly	157	----------	152	153
Mississippi Delta	180	196	----------	191
Sandy Coastal Plains, Southwestern	259	264	249	251
Ozark-Ouachita Mountains and border	206	219	173	188
Northern Lake States	299	312	----------	306
Northwestern New Mexico	----------	----------	261	261
Cascade and Rocky Mountain areas	358	----------	----------	358
Problem areas, total	201	197	175	187
All rural counties	----------	----------	----------	246
U.S. total	----------	----------	----------	294

Compiled from Biennial Survey of Education in the United States, 1954–56. Ch. 3, secs. III and IV.

further dissipated by the inefficiencies of a dual school system. Also involved are differences in ability and desire to expend more for schools.

Conclusion

Schools in low-income rural areas share many of the problems faced today by all U.S. schools. Such conditions as rising costs, scarcity of personnel, and population movements affect all schools in some degree. Problems associated with sparsity of population are not so pressing for the low-income area schools as they are for those in part of the Plains States. On the other hand, problems of adequate school financing are most pressing in these low-income areas.

Other studies show that most of the low-income States expend a higher percentage of their income on education than do some of the more affluent States. Yet these same studies show that the low-income States do not use as high a proportion of their wealth for educational purposes as do some other States that are only slightly more affluent. A significant variable seems to lie in a difference in the value placed on education in relation to other things. Another factor is found in the prevalent feeling that funds used for educational purposes represent consumption expenses. If they are recognized to be a capital investment, the question of whether the group can afford the expenditure no longer exists—they cannot afford *not* to make the investment.

Whatever decision is made concerning the sources of funds for education, it can be assumed as true that the character of education provided in a local community is of central importance to any plan for its lasting economic and social development.

World Abstracts of Agricultural Economics Research

AGRICULTURAL ECONOMISTS, rural sociologists, and research workers in related discplines are now able to keep abreast of most of the literature in their fields currently published in their own and other countries through an international abstracting service. Launched in 1959 on an experimental basis, *World Agricultural Economics and Rural Sociology Abstracts*, a quarterly in English edited in Vienna and published in Amsterdam, is rounding out its third year of expanding usefulness to social scientists in all countries. Since no researcher can read all pertinent or related material, these abstracts, which indicate contents, give him an idea as to items that he must read. A quarterly publication, this journal is issued in March, June, September, and December. Titles of abstracts are given in the original language, followed by an English translation.

Dr. Sigmund von Frauendorfer, editor of the journal, was librarian at the International Institute of Agriculture, forerunner of the Food and Agriculture Organization of the United Nations until the institute was absorbed by FAO in 1946. He is both a trained agricultural economist and an experienced librarian and editor. The former *International Bibliography of Agricultural Economics*, published in Rome by the International Institute of Agriculture, was edited by Dr. von Frauendorfer from 1938 to 1946. At present, in addition to his duties as editor of the *Abstracts*, he is a lecturer at the Hochschule für Bodenkultur, the College of Agriculture, in Vienna, editor of "Schriftum der Agrarwirtschaft," and adviser to the Austrian Ministry of Agriculture in setting up a documentation service and library at the Agrarwirtschaftliches Institut. Dr. von Frauendorfer has an assistant editor, Miss Thirkell Smith, who was appointed last year on the recommendation of agricultural economists in the United Kingdom.
mendation of agricultural economists in the *Abstracts*—the International Association of Agricultural Librarians and Documentalists and the International Association of Agricultural Economists (IAAE), which recently changed its name from International Conference of Agricultural Economists. Supporting grants to the journal have been made by the Council on Economic and Cultural Affairs, Inc., the Commonwealth Agricultural Bureaux, and the Ford Foundation. At first, the subscription price was $12.50 a year, but beginning with 1961 it was reduced to $8.50 in accordance with a suggestion of the Ford Foundation, in order to secure wider circulation, especially in less developed countries.

A summary of abstracts published in the journal in 1960 indicates that the United States leads the world in number of items in economic and rural sociology literature reported. Abstracts of U.S. publications numbered 444, about 18 percent of the total. Other countries largely represented were the German Federal Republic with 289 abstracts, the United Kingdom with 271, and the Soviet Union with 181; the U.S.S.R. references were mostly from indirect sources. A breakup by principal countries of origin is shown in table 1.

More than 50 subjects are listed in the classification scheme and contents of the journal. Among the more numerous groups of subjects abstracted are agricultural policy, agricultural credit, and agricultural marketing; farm organization and management, farm returns, and farm accounting; rural sociology and farm labor. Other categories that receive greater than average attention are plant and animal products, agrarian collectivism and reform, consumption, land tenure, mechanization, and econometrics. An author index is published with each issue as well as a separate annual index listing authors, subjects, and places covered. Technical journals published in many countries are searched for literature to be abstracted and for abstracts already published. *Agricultural Economics Research* supplies advance manuscript pages of its own digest of selected recent publications in agricultural economics issued by the U.S. Department of Agriculture and cooperatively by State universities and colleges.

Through arrangements made by the U.S. Council of IAAE, Dr. von Frauendorfer receives abstracts of publications issued in the United States from specialists in the U.S. Department of Agriculture. Fields covered and the name of the specialist responsible for each follow:

Rural Sociology, Dr. Paul J. Jehlik; *Agricultural Economics*, Dr. James P. Cavin; *Marketing*, Dr. Louis F. Herrmann; *Land Economics*, Mr. Mark M. Regan; *Farm Management*, Mr. Warren R. Bailey and Dr. John M. Brewster; *Cooperation*, Mr. J. Kenneth Samuels; *Agricultural Credit*, Dr. Fred L. Garlock; *Agricultural Statistics*, Dr. Ross L. Packard; *Consumption Economics*, Mr. Thomas J. Lanahan, Jr.; *Extension*, Mr. Karl G. Shoemaker; *History*, Dr. Wayne D. Rasmussen; *Econometrics*, Mr. Anthony S. Rojko; and *International Studies*, Dr. Lois B. Bacon. Publications that research workers desire to be abstracted should be sent to the specialist in the research field indicated, and addressed U.S. Department of Agriculture, Washington 25, D.C.

More than 50 U.S. research workers have contributed abstracts to the journal to date. These abstractors, whose names are listed below, are in the Economic Research Service, the Statistical Research Service, or, in a few instances, other agencies in the Department or Land Grant Universities and Colleges.

Table 1.—*Number and percentage of abstracts by principal countries of origin*

Country	Number of references	Percentage
Australia	55	2. 2
Austria	34	1. 3
Belgium	47	1. 9
Bulgaria	22	. 9
Canada	12	. 5
Czechoslovakia	66	2. 6
Denmark	22	. 9
France	91	3. 6
German Federal Republic	289	11. 4
Hungary	29	1. 1
India	140	5. 5
Israel	10	. 4
Italy	89	3. 6
Japan	22	. 9
Mexico	12	. 5
Netherlands	97	3. 8
Norway	15	. 6
Pakistan	21	. 8
Poland	132	5. 2
Portugal	15	. 6
Soviet Union	181	7. 2
Spain	32	1. 2
Sweden	84	3. 3
Switzerland	45	1. 8
United Kingdom	271	10. 7
United States	444	17. 6
Yugoslavia	12	. 5
International organizations	111	4. 4
Other countries	127	5. 0
Total	2, 527	100. 00

American Contributors to World Agricultural Economics and Rural Sociology Abstracts

Kenneth E. Anderson
A. Angelidis
Donald B. Agnew
William R. Askew

Henry T. Badger
Warren R. Bailey
Roy A. Ballinger
Harold E. Barnhill

Clay G. Barry
John M. Brewster
Imogene Bright
Marguerite C. Burk
James P. Cavin
Philip B. Dweskin
William A. Faught
Winn F. Finner
Fred L. Garlock
Martin J. Gerra
Leo Gray
Gertrude Gronbeck
Margaret Hagood
Arthur Harlow
Edmond S. Harris
Walter A. Hendricks
Clarence I. Hendrickson
Louis F. Herrmann
Budd A. Holt
L. D. Howell
G. A. Kooy
Paul R. Kulp

Thomas J. Lanahan, Jr.
L. C. Larkin
Harold R. Lindstrom
A. C. Manchester
Alvin Macomber
Mardy Myers
Alice Fray Nelson
Ross L. Packard
Victor B. Phillips
Jules W. Powell
Wayne D. Rasmussen
Mark M. Regan
V. J. Rhodes
Earl Riner
Anthony S. Rojko
Seymour M. Sackrin
J. Kenneth Samuels
Karl G. Shoemaker
R. C. Soxman
John W. Thompson
W. F. Williams
Alois F. Wolf

Sherman E. Johnson, Deputy Administrator for Foreign Economics, former president of the International Conference of Agricultural Economics, was until recently ex officio chairman of the Editorial Board. Harry C. Trelogan, Administrator of the Statistical Reporting Service, is a member of the Board, which consists of economists from eight countries. Among the ex officio members is Foster E. Mohrhardt, Director of the Library of USDA, in his capacity of president of the International Association of Agricultural Librarians and Documentalists, the organization chiefly responsible for the journal's publication. Dr. Trelogan coordinates the work of abstractors in the United States. Charles E. Rogers, editor of *Agricultural Economics Research*, receives and edits the American abstracts and mails them to Vienna for publication.

A meeting of the Editorial Board was held in August in connection with the eleventh International Conference of Agricultural Economists at Cuernevaca, Mexico. The board members commented on the work of the editorial office and considered the future outlook as well as financial problems.

Correspondence concerning editorial matters should be addressed to Dr. Sigmund von Frauendorfer, Agrarwirtschaftliches Institut des Bundesministeriums für Land- und Forstwirtschaft, WIEN XIII, Schweizertalstrasse 36 (Austria). Subscriptions should be sent to the North-Holland Publishing Co., P.O.B. 103, Amsterdam, Netherlands. The subscription price of $8.50, 61s., Gld. 32,00, or the equivalent in other currencies, includes the four quarterly issues of an annual volume and the separately published annual author and subject index.

Book Reviews

New Laws for New Forests. By Erling D. Solberg. University of Wisconsin Press, Madison. 611 pages. 1961. $7.50

FIRE AND TAXES, it has been said, are the chief obstacles to the practice of sound forestry throughout much of this country. Erling Solberg agrees, and he shows how one State has moved to surmount these obstacles through a succession of laws and programs. The book's subtitle, "Wisconsin's Forest-Fire, Tax, Zoning and County-Forest Laws in Operation," implies that it is neither legal nor historical scholarship so much as economic evaluation; in any case, squarely within the domain of the land economist. The impact of the four laws and their predecessors is examined in detail for Oneida County and, less intensively, for the forested portion of the State.

At the turn of the century, the virgin forests of the Northern Lake States supported a thriving logging industry. This industry soon exhausted its natural resource base and moved on, leaving in its wake millions of cutover acres and a population sustained by little more than an abiding faith that the plow would follow the ax. That it would not is heresy turned history. Agricultural depression and wholesale land abandonment were necessary to drive home the lesson.

Meantime, repeated severe fires, largely the result of land clearing, had retarded immeasurably the return of the forests to productive conditions. Destitute local governments had raised property taxes to confiscatory levels in order to finance their operations. It was at this time of crisis, some 30 years ago, that the laws creating Wisconsin's forest protection, taxation, county forest, and rural zoning programs were enacted.

An adequate forest fire-control program was a prerequisite to rehabilitation and reforestation in the northern counties. After years of experimentation with ineffectual forms of local responsibility, the present State organization was created. Adequately financed, unhampered by political boundaries, and oriented toward prevention and detection, as well as suppression, it has succeeded admirably by any standards. But Solberg expresses the feeling that it may soon be threatened by a constitutional ceiling on forestry expenditures.

Confiscatory taxation was countered by an optional special tax law of the widely used yield-tax type. Unique to Wisconsin is a system of annual

State loans to local governments with repayment through yield-tax revenues. Although this tax law has not been widely used, Solberg feels that it has been effective in placing a ceiling on property tax assessments. He concludes that the tax rates established under the law are still too high and that the evolution of a workable system of forest taxation has not yet run its course.

Tax-delinquent land in Wisconsin reverted to the counties rather than to the State, but at a time when the forested counties had neither the inclination nor the resources to undertake the necessary rehabilitation. A program, largely State financed, was created to do this job by amending the private forest tax law, with its system of State aids to local government. The resulting county forest program has accomplished much, but suffers from ambiguities and inconsistencies deriving from the method of its creation. Solberg recognizes the need for substantial legislative changes and has several to offer.

Rural zoning was initiated in Wisconsin in an effort to achieve better land use and to cut the costs of rural government. If the evidence of the accomplishments of this program is less conclusive, the challenges and opportunities that lie ahead are more compelling.

New Laws for New Forests is a careful and detailed study of land use laws in action. It merits the attention of lawyers in this field, of land economists, of foresters, of land-use planners, and of the Wisconsin Legislature. It is thoroughly documented with a lengthy statistical appendix. One may question the view that taxes have been a major influence on forestry in Wisconsin, or regret the fact that Solberg's analysis is based on data no less than 10 years old—more recent data have been added, but seldom incorporated, in the text. The book has its share of minor errors, but these are insignificant drawbacks to a most valuable study.

William B. Lord

Marketing of Agricultural Products. By Richard L. Kohls. New York. The Macmillan Co. Second edition. 424 pages. 1961. $7.50.

AS WAS TRUE of the first edition, Professor Kohls directs the text of this second edition of *Marketing of Agricultural Products* to students who are just beginning their study of the marketing of agricultural products. The author meets this purpose exceedingly well; the text is readable and simple, highly commendable features of a textbook.

This book should be appealing and useful both to students with little or no previous contact with economics and to those with some elementary economics. It will also be valuable to many producers and marketers of agricultural products in providing a sound understanding of the processes, costs, and dynamic changes taking place in the marketing of farm products. A survey rather than a complete coverage of the subject of agricultural marketing, the book likely will have limited value to marketing researchers with a professional background in economics and marketing. But the professionals are not the primary audience that the author endeavors to reach.

The organization of the second edition is the same as the first. It is divided into three parts: "The Framework of the Marketing Problem," "Some Functional Problems," and "Commodity Marketing and Problems." Two new chapters are in the second part: "Expanding Demand for Agricultural Products" and "Market Organization."

Selective references are mostly brought up to date; only in the chapters on cotton and tobacco marketing are they based mainly on pre-1950 reports. Not listed is L. D. Howell's comprehensive treatment of marketing of fibers in Technical Bulletin 1210, "Changes in the American Textile Industry," November 1959. The charts, an important part of the book, also are brought up to date. Liberal use of publications on marketing research published by the U.S. Department of Agriculture is evident in charts and references.

Kenneth E. Ogren

Agricultural Marketing in India and Abroad. By R. S. Srivastava. Vora & Co., Publishers Private Ltd., 3 Round Bldg., Bombay 2, India. 243 pages. 1960. 12.50 rupees ($4.51).

THAT AN EFFICIENT marketing system, particularly with respect to agricultural products, is the keystone to promoting a mass production and consumption economy is borne out in this study. Through extensive comparisons of India's agricultural and marketing mechanism with those of other countries, the author shows that the solution to India's food problem depends to a great extent on further development of the marketing process. His study reveals the backwardness of India's present agricultural marketing system and its agriculture, and concludes that too little has been done in India toward providing an efficient marketing structure.

For the researcher interested in the Indian agricultural marketing system, this book should prove to be useful. Although the structure of India's agriculture is set forth in the first chapter, this does not provide much more than a typical encyclopedic approach. However, Indian standards of agricultural marketing, and the development of transportation, storage, and marketing costs are adequately covered. For the most part, these elements in marketing are expounded on a parallel basis with those in eastern and western countries, particularly those in the United States and Canada.

As the book's publication date gives no clue to the relative timeliness of the statistical data, it might be helpful to mention that this work is a revised version of the author's thesis, accepted by the University of Oxford in 1948, entitled "Some Aspects of Agricultural Marketing in India, with Special Reference to Developments in Western Marketing Systems." Revisions update most of the statistical data to around 1956 and 1957; but for many purposes they may be somewhat outdated.

The author has relied mainly on published material and personal visits to markets and marketing institutions in the British Isles, Belgium, Holland, Denmark, and France in securing data for the study.

William F. Hall

Physical Distribution Management. By Edward W. Smykay, Donald J. Bowersox, and Frank H. Mossman. The Macmillan Co. 283 pages. 1961. $6.

PHYSICAL DISTRIBUTION is concerned with the spatial arrangement of plant capacity and warehouse facilities so that the movement costs are cut to a minimum while marketing requirements of the firm are satisfied. With these words the authors of this new marketing textbook describe the subject matter covered.

The special audience for the work appears to be undergraduate students hopeful to become business executives who might miss the insight that economic and statistical anaylses offer in deciding on the where, when, and how to store and transport products. Conventional business courses in marketing and management may not provide such perspectives.

Chapter 4, "The Total Cost Approach to Physical Distribution," presents the unifying theme of the book. Elementary algebra and graphic analysis are used to show cost budgets for alternative combinations of transport and storage, under hypothetical fixed and variable costs. Successive chapters examine various parts of the problem—inventory control, forecasting demand, plant location determinants, impact of transport costs on location, and distribution warehousing. A concluding chapter and three at the beginning, which cover subjects concerned with elementary marketing and transportation aspects, round out the book.

The work is a sort of operations research guide. Because it eschews linear programing models and the like, it might meet the needs of a fairly wide audience. The style is readable if somewhat repetitious and the organization within some chapters seems fragmented. Some of the arguments are defective; for example, the authors say that the increase in freight rates since World War II has narrowed the geographical markets supplied from a given location; but this result comes from a model which assumes that manufacturing costs have not risen since World War II (pp. 7–9).

The most interesting feature of this work to this reviewer is its implications about marketing as a field of study: The total cost approach to the firm logically includes processing activities, as well as transport, storage, and distribution. *All involve production economics!* Yet, the book is presented as a pioneering job in marketing. What then is the analytical province for marketing economics? Evidently, it is the study of the exchange process and its bearing on production and consumption adjustments.

In this context, the major idea the work suggests is this: The larger the business firm under study the less is the influence of market valuations and the more the influence of intrafirm valuations, on marginal changes in processing, transporting, and storing by the firm. It is a large idea that cuts across the boundaries of production and marketing as traditionally defined. Business executives of large corporations interested in the viability of their firms might be concerned with this problem just as much as economists who are interested in the viability of the market economy.

Allen B. Paul

Agricultural Production Functions. By Earl O. Heady and John L. Dillon. Iowa State University Press, Ames. 640 pages. 1961. $6.95.

ONE MIGHT look on this book as the culmination—or at least a summary interlude—of a monumental research project conceived by the senior author 10 to 15 years, or even longer, ago. In this monograph, those interested in production function estimation will find not only "how to do it" but also "how it has been done."

The theoretical or "how to do it" section discusses and analyzes, leisurely and lucidly, these facets of production functions and the estimation thereof—economic applications, forms of functions and their selection, data analysis, collection of data, problems of economic specification, and miscellaneous empirical problems.

The empirical, or "how it has been done," section brings together the results of numerous feeding, fertilizer, and farm-firm production studies completed at Iowa State University within the last 10 years. Most of these studies represent research efforts of Professor Heady and his students in cooperation with animal nutritionists and agronomists. Here are presented feeding experiment functions—hogs on drylot, hogs on pasture, broilers, turkey, milk, and beef—and fertilizer-experiment functions—corn, red clover, and alfalfa. This section also includes production functions of the firm based on survey and farm account records. In most instances, several functional farms are fitted to the same data, and each function is analyzed in detail from the economic viewpoint.

These two major sections are sandwiched between two interesting chapters, one on the development and some early results of production function studies, and the other on some comparisons of farm-firm production functions estimated in various countries over the world.

Researchers about to take the production function trail for the first time should find the reading of this book rewarding. But they should not pass lightly over this statement, which appears on page 255: "The use of estimated production functions as a guide to economic allocation of resources is fraught with problems."

Others who have been over the trail before should also find many helpful hints here. The authors take extreme pains to point out the pitfalls involved in production function analysis and how to cope with them, when possible.

Mature students of production economics should also find this monograph worthwhile reading, especially the first section, which presents—usually starting with the elementary and proceeding to the more complex—many of the principles of production economics.

The monograph fills the need for summarization in one volume of the theoretical foundation of production function analysis and much of the empirical work in agriculture. It may become the standard handbook on the subject. If, after digesting this volume, the reader thirsts for additional reading refreshment on agricultural and other production functions, a bibliography of 270 items should provide some idea of where to start.

Alvin C. Egbert

The Tax Exemption of Cooperatives. Second edition. By Robert T. Patterson. University Publishers, Inc., New York. 122 pages. 1961. $5.

VIEWS with regard to the taxation of the income of cooperatives differ according to the economic position or philosophy of those who hold them. With this statement, about halfway through his book, the author comes face to face with his own dilemma.

Patterson's position is that cooperative net margins should be taxed as though they were profits in an investor-type corporation and that patronage dividends also should be fully taxed to patrons as though they were corporate dividends. He acknowledges, however, that "even these measures . . . would be insufficient to establish tax equality, as cooperatives could adjust their prices in order to reduce net margins. . . ."

Exaggerated and biased estimates of the loss in revenue supposedly due to present cooperative tax treatment are quoted when more accurate data, based on scientifically conducted statistical studies, are publicly available. (See: "Tax Treatment of Earnings of Cooperatives," Hearings before the Committee on Ways and Means, House of Representatives, 86th Cong., 2d sess. Feb. 1–5, 1960, pp. 20, 39.)

The real situation, which this author ignores, is that any business, whether individually owned, a partnership, a cooperative corporation, or an investment-type corporation, does not realize "income," as that term has been defined under the 16th amendment to the Constitution, from the type of transactions that take place in cooperative organizations. These are transactions in which the participation of the firm in sales receipts is limited by prior contract to recovery of its costs; the firm is under an unconditional obligation to pay or return to someone else whatever might otherwise constitute a gain to it. (Compare: Part IV of the paper by Wilfrid E. Rumble, "Tax Revision Compendium, Compendium of Papers on Broadening the Tax Base," submitted to the Committee on Ways and Means, Vol. 3, pp. 1953–1961 (1959).)

Cooperatives, though they are corporations, are completely different in basic legal and economic respects from investor-type corporations, just as individual firms and partnerships are different. Those who persist in trying to make them over into something they are not, for the purpose of fitting them into the mold of an income tax on profit-oriented corporations, are simply confusing the issue.

Raymond J. Mischler

Our National Park Policy; A Critical History. By John Ise. Published for Resources for the Future, Inc., by the Johns Hopkins Press, Baltimore. 701 pages. 1961.

OUR NATIONAL PARK policy is an interesting and important problem for the economist as well as for the conservationist, political scientist, forester, and citizen. John Ise, a capable historian of conservation problems, has written a volume of importance to every citizen who visits a park, and a volume that will prove invaluable to any analyst of natural resources. This reviewer found that the book added greatly to his understanding of park problems during a recent visit to several national parks and monuments.

The first part of the book is a detailed account of the establishment and administration of each of the parks established prior to World War I. The second part is arranged chronologically by administrators of the National Park Service. The third section deals with such park problems as wildlife, concessions, and finances.

Professor Ise is an ardent advocate of worthwhile national parks. The heroes of his story are the public-spirited citizens and naturalists who devoted their lives to park establishment and protection, National Park Service officials, conservationists, and Congressmen and Senators who consistently supported the parks. The author sees western livestock men, the miners, the lumbermen, the Congressmen and Senators who opposed parks, sportsmen, the Bureau of Reclamation, and the Forest Service, as antagonists. The clashes between these groups make a fascinating story.

The interest in these clashes points up the basic economic and social problem—how much of our land should be in parks and what restrictions should be placed on its use. As Professor Ise points out, when more and more people use the parks, the cost of maintaining them increases, and most of this cost is met by the taxpayers. The concessionaires are making very little money, and in some parks, some of the public facilities verge upon slums. The author suggests some answers to these problems. The reader must ask, as does the author, whether or not some of the answers are feasible, either from the economic viewpoint or from the viewpoint of public acceptance. In any case, the time is appropriate for a searching review of our national park policies.

Wayne D. Rasmussen

Rice—Domestic Consumption in the United States. By Parley M. Pratt. Bureau of Business Research, University of Texas, Austin. 217 pages. 1960. $4.

PER CAPITA CONSUMPTION of rice is low in the United States compared with that in other countries. To study the problem, the author conducted hundreds of individual interviews based on a carefully constructed questionnaire. He then compiled and analyzed the data to provide insight into the buying habits of the consuming public with a view to giving direction to sales and promotion programs designed to expand the domestic market for rice and rice products.

Consumers in three States were sampled in major urban centers—Atlanta, Dallas, and Denver—with varying overall rice consumption patterns. Included in the study were analyses by ethnic groupings, income classifications, and geographic locations, as well as purely personal preference.

While Dr. Pratt's outstanding contribution is his consumer preference study, he also makes an overall analytical commodity study, which presents a comprehensive background of the entire rice industry. This analysis includes a brief history of the domestic and world rice industry, together with a description of the past and present production and processing methods used in the United States.

During World War II and immediately following its termination, U.S. rice production and processing facilities were increased substantially in response to the need to help feed our Allies in the Pacific, and to fill the vacuum in the world market left by the withdrawal of the Asiatic exporting countries. Later, when the older producing areas in Asia were once again able to supply their own needs and compete in world markets, the demand for U.S. rice declined, leaving excess farm equipment and mill capacity.

This book contains practical information and suggestions to rice growers, millers, and marketers who desire to reach the ultimate consumer.

Robert E. Post

The Agricultural Register (*New Series*) : *Changes in the Economic Pattern 1957–59.* Agriculture Economics Research Institute, University of Oxford. Oxford University Press. 1960. 147 pages.

STUDENTS of British agriculture will find the second postwar issue of the *Agricultural Register* an indispensable reference work. Almost completely rewritten since the 1956–57 *Register*, this edition, like its predecessors, provides a wide variety of descriptive material relating to current British agricultural policy. The facts, which are set forth without appraisal, generally relate to developments during 1957–59.

Selected Recent Research Publications in Agricultural Economics Issued by the U.S. Department of Agriculture and Cooperatively by the State Universities and Colleges [1]

BERNITZ, ALEXANDER. THE AGRICULTURAL SITUATION IN EAST GERMANY. U.S. Dept. Agr. Econ. Res. Serv. ERS-Foreign-5, 24 pp., illus. 1961.

Indications are that East Germany will not achieve its 1965 goal of equaling West Germany's agricultural or per capita consumption levels, but improvements can be expected in yield, productivity, and quality of product. Prospects for 1960–61 appear unfavorable. Official Government appeals during June stressed the need for farmers to make up recent losses by working longer hours until the situation is again normal.

BROWN, LESTER R. THE JAPANESE AGRICULTURAL ECONOMY. U.S. Dept. Agr. Econ. Res. Serv. ERS-Foreign-7, 32 pp., illus. 1961.

With a population half that of the United States and a land area smaller than California, Japan produces 80 percent of her own food. Food crops occupy 90 percent of the agricultural land, with feed grains, forage crops, and agricultural raw materials for industry in a minor position. In the past decade, Japan has been the principal U.S. agricultural market, with shipments, chiefly of wheat, barley, corn, cotton, hides and skins, tallow, and soybeans, averaging $390 million annually.

CSORBA, J. J., AND BUTLER, G. G. DAIRY COWS: HOUSING AND METHODS OF MILKING. U.S. Dept. Agr. Econ. Res. Serv. ERS–15, 31 pp. 1961.

New techniques in milking, handling, feeding, and housing have been extremely effective in reducing the labor necessary for milking cows. Pipeline milking, bulk tanks, automatic feeding, milking parlors, and loose housing are among the most important innovations that have increased milk production per man, or per man-hour of labor, during the last 15 years. In 1958, with mechanical milkers, three times as many cows were milked per hour in a stanchion barn and more than four times as many in a modern herringbone milking parlor, as in 1938.

ECONOMIC RESEARCH SERVICE, U.S. DEPARTMENT OF AGRICULTURE. GRAIN MARKETING IN THE SOVIET UNION, WITH EMPHASIS ON WHEAT. U.S. Dept. Agr., 57 pp., illus. 1961.

Report of a USDA technical study group that visited Russia in 1960 to study grain handling, storage, and processing operations and research in the Soviet Union.

EGBERT, A. C., AND HEADY, E. O. REGIONAL ADJUSTMENTS IN GRAIN PRODUCTION. A LINEAR PROGRAMING ANALYSIS. U.S. Dept. Agr. Tech. Bul. 1241, 66 pp., illus. 1961. Supplement to Tech. Bul., 58 pp. 1961.

This report is first in a series of exploratory studies, regional in nature, analyzing the farm surplus situation and the corollary adjustment problems of agriculture. Wheat and feed grains are discussed. Brief explanations of the methods used to collect and estimate the data are given. Included in the supplement are mathematical models, proofs, methods of data collection and estimation, and supplementary tables.

ELEFSON, R. V., AND RAUP, P. M. FINANCING FARM TRANSFERS WITH LAND CONTRACTS. Minn. Agr. Expt. Sta., Sta. Bul. 454 (North Central Regional Pub. 122), 32 pp., illus. 1961.

Use of the installment land contract has increased in the North Central Region in the last 15 years. Together with other similar forms of low-equity financing, including the deed of trust with power of nonjudicial sale and low downpayment mortgage, the land contract has emerged as a possible aid in meeting the growing problem of financing land ownership in modern agriculture. The laws and practices of 13 States are covered in this report.

FARNWORTH, CONSTANCE H., AND MEARS, LEON G. U.S. FARM PRODUCTS FIND MARKET AND COMPETITION IN VENEZUELA. U.S. Dept. Agr. Foreign Agr. Econ. Rpt. 1, 28 pp., illus. 1961.

In 1960, Venezuela replaced Cuba as our No. 1 Latin American market for farm commodities. Products originating in practically all of our 50 States find a market there. The United States in turn is the principal market for Venezuela's exports. However, competition building up during recent years from third suppliers and from increased domestic production and protectionism have begun to cause concern among U.S. farmers and traders.

FULLER, T. E. DESCRIPTION AND ANALYSIS OF A RURAL AREA IN NORTH CENTRAL PENNSYLVANIA PRIOR TO THE ESTABLISHMENT OF AN INDUSTRIAL PLANT. Pa. Agr. Expt. Sta. A.E. and R.S. 26, 113 pp., illus. (Mimeographed.) (Agr. Res. Serv. cooperating.) 1961.

Report describes and analyzes the economic effects on agriculture of the location of an industry in a rural area. Curtiss-Wright recently located on a 50,000-acre block in Clearfield, Elk, and Cameron Counties, Pa. Most of the land was in forest, largely State owned. Geographic location of plant draws workers from at least a five-county area, parts of which are important agriculturally.

GARLOCK, F. L., HANSING, F. D., SCOFIELD, W. H., AND OTHERS, UNDER DIRECTION OF N. J. WALL. THE BALANCE SHEET OF AGRICULTURE, 1961. U.S. Dept. Agr., Agr. Inform. Bul. 247, 23 pp., illus. 1961.

During 1960, value of farm assets rose to about $206.1 billion from about $204.8 billion in 1959. Land values continued to rise in all regions except the Corn Belt. The realized net income of farm operators from farming was $11,700 million—about a 4-percent increase over 1959.

---

[1] State publications may be obtained from the issuing agencies of the respective States.

Despite higher incomes, farmers appeared to be in a tighter cash position, owing to continued decline in farmers' liquid assets and debts and reduction of about $475 million in farmers' expenditures for motor vehicles and machinery.

Gibson, W. L., Jr. RENTING FARMS IN SOUTHSIDE VIRGINIA. Va. Agr. Expt. Sta. Bul. 523 (Southeast Land Tenure Research Committee Pub. 38), 36 pp. 1961. (Agr. Res. Serv. cooperating.)

This is a descriptive study of farm rental arrangements in Southampton and Halifax Counties, Va., compared with those of 20 years ago. Tenants, part owners, and owners were interviewed in order to compare farms operated under different forms of tenure. Most farms in both counties are leased under a share-rent agreement—a ½-share lease in Southampton and a ¼-share lease in Halifax County. In Halifax County, share rental arrangements remained essentially unchanged over the years. In Southampton County, however, share leasing shifted away from a ⅓-share lease in earlier years.

Gronbech, Gertrude. CONSUMPTION TRENDS AND PATTERNS FOR VEGETABLES, POTATOES, SWEETPOTATOES, AND DRY BEANS AND PEAS. U.S. Dept. Agr., Agr. Handb. 215, 57 pp., illus. 1961.

In the last 50 years, per capita consumption of vegetables has increased about 15 percent, but use of potatoes, sweetpotatoes, and dry beans and peas has decreased substantially. During the next 10 years, per capita use of vegetables and potatoes is expected to remain about the same as at present, but some further shift to processed items is expected. Use of sweetpotatoes and of dry beans and peas may continue to decline.

Hall, Richard. IMPACT OF UREA ON OILSEED MEAL MARKETS U.S. Dept. Agr. Mktg. Res. Rpt. 472, 19 pp., illus. 1961.

Urea as a source of nitrogen for rumen synthesis of protein seems unlikely to replace natural proteins in mixed feeds in any substantial degree, but its use is expected to increase relatively more in the next few years than use of natural proteins. Consumption is expected to rise from about 81,000 tons in 1959 to 125,000 tons in 1964, equivalent to about 10 percent of the projected level of protein ingredients fed to ruminants.

Hesser, L. F., and Janssen, M. R. USE OF CREDIT BY FARMERS IN CENTRAL INDIANA. Purdue (Ind.) Agr. Expt. Sta. Res. Bul. 718, 8 pp., illus. 1961. (Agr. Res. Serv. cooperating.)

In 1958, insurance companies were the main source of real-estate credit for farmers. Long-term loans held by individuals were next in volume. Nearly half the volume of non-real-estate credit to farmers was by commercial banks. Production credit associations supplied the next largest volume. Banks and production credit associations extended 68 percent of the non-real-estate loans to farmers in central Indiana.

House, P. STATE ACTION RELATING TO FARMLAND ON THE RURAL-URBAN FRINGE. U.S. Dept. Agr. Econ. Res. Serv. ERS—13, 23 pp. 1961.

This report summarizes legislation enacted or considered by various State legislatures in an effort to cope with the problems of taxing agricultural lands lying in the path of urban expansion. Pertinent sections of State laws and bills that deal with criteria for assessing such farmland are quoted in full or in part. Several States have sought to handle the problem without enabling legislation through special instructions to local tax assessors. Samples of these instructions in tax assessors manuals are contained in the appendix. No attempt is made to evaluate either the desirability or the effectiveness of these various measures.

Lowenstein, Frank, and Wittman, Charles H. FIBERS USED IN TEXTILE MANUFACTURES ENTERING UNITED STATES FOREIGN TRADE—QUANTITIES OF THREE MAJOR FIBERS USED U.S. Dept. Agr. Mktg. Res. Rpt. 491, 30 pp., illus. 1961.

The total volume of trade in manufactures of basic textile fibers—cotton, wool, and manmade—more than doubled in the 1920–60 period. Measured in tons of fiber equivalent, textile exports exceeded imports in every year except 1960, when, due chiefly to increase imports of manufactured textile products, imports exceeded exports by 58 million pounds.

Lynch, John V., and Ferree, Paul J. THE AGRICULTURAL ECONOMY OF BOLIVIA. U.S .Dept. Agr. Econ. Res. Serv. ERS-Foreign-1, 19 pp., illus. 1961.

Almost two-thirds of the Bolivian people work in agriculture, yet a third of the food is imported. The chief agricultural imports are grains, sugar, and vegetable oils. The United States and Argentina are the principal sources of wheat; sugar is imported mainly from Peru. Agricultural development has been slow, but under the agrarian reform law of 1953 the Bolivian Government envisions greater opportunities for those engaged in agriculture.

Maitland, Sheridan T., Stansberry, Robert R., Jr., and Friend, Reed E. THE HIRED FARM WORKING FORCE OF 1959. U.S. Dept. Agr., Agr. Inform. Bul. 238, 53 pp., illus. 1961.

About 3.6 million persons did some farmwork for wages in 1959. This was 15 percent fewer workers than in 1958, but they worked on the average more days to produce the 1959 agricultural output. The increase in days worked, plus slightly better nonfarm earnings, brought average annual earnings from farm and nonfarm work to $1,038, up from $961 in 1958.

Martin, Robert G. RAW SUGAR. WEIGHT AND POLARIZATION CHANGES DURING BULK SHIPMENT FROM PUERTO RICO. U.S. Dept. Agr. Econ. Res. Serv. ERS–7, 12 pp. 1961.

Comparisons made during 1957–60 show that changes in weight and polarization in sugar in transit from shipping terminals in Puerto Rico to mainland ports have been decreasing in size since 1957. The decline in value to Puerto Rico producers from weight and polarization changes in 1960 amounted to about $230,000; total value of the sugar shipped was $91 million.

Mathis, Anthony G., Johnson, Robert W., and Anderson, Elsie D. SELECTED PROBLEMS IN BUTTERFAT SAMPLING AND TESTING. U.S. Dept. Agr. Mktg. Res. Rpt. 482, 34 pp. 1961.

Report of eight studies to determine how and to what extent the use of different techniques in sampling and testing butterfat may affect test results. Results of the studies provide a basis for increased confidence in methods of testing and verifying tests of milk delivered to plants by milk producers.

MURRAY, KENNETH L. THE AGRICULTURE SITUATION IN RUMANIA. U.S. Dept. Agr. Econ. Res. Serv., ERS-Foreign-4, 29 pp., illus. 1961.

Despite government policies in favor of heavy industry, nearly two out of every three of Rumania's people still make their living in agriculture. The average diet has improved somewhat in recent years, but two-thirds of the total calories still are derived directly from grains· The moderate increase in farm production since prewar days has not been sufficient, except for sugar and vegetable oils, to supply significantly larger quantities of food.

NALE-POVIC, JOSEPH G. TRAFFIC PATTERNS IN DOMESTIC WATER TRANSPORTATION OF FARM PRODUCTS AND SUPPLIES. U.S. Dept. Agr. Mktg. Res. Rpt. 465, 56 pp., illus. 1961.

An analysis, by major agricultural commodity groups, of transportation of agricultural products by coastwise, lake, and river traffic shows that, in 1957, 44 percent of the traffic on domestic waterways moved on the rivers, 29 percent was coastwise traffic, and 17 percent lake traffic. These figures represent gains of 125 percent and 29 percent in river and coastwise traffic, respectively, and a loss of 22 percent in lake traffic since 1949.

PATTY, GORDON. AGRICULTURE AND TRADE OF PARAGUAY. U.S. Dept. Agr. Econ. Res. Serv. ERS-Foreign-6, 15 pp., illus. 1961.

Subsistence farming is prominent in Paraguay despite considerable progress in commercial agriculture. Agriculture accounts for half the labor force, more than a third of the national income, and two-thirds of all export value. Poor distribution of population and insecurity of land tenure, together with inadequate transportation and marketing facilities, have been factors in delaying agricultural development.

PAVELIS, G. A., JOHNSON, H. P., SHRADER, W. D., AND TIMMONS, J. F. METHODOLOGY OF PROGRAMING SMALL WATERSHED DEVELOPMENT. Iowa Agr. and Home Econ. Expt. Sta. Res. Bul. 493, pp. 122–160, illus. 1961.

The area selected to demonstrate watershed planning was the 480-acre Nepper Watershed in Monona County, Iowa. Interests of farmers in watershed planning centered around finding oportunities to obtain the benefits of increased productivity and additional benefits from reduced sheet erosion, gully erosion, or flood damage to onsite crops. The county was interested in reducing or eliminating the expense of maintaining a bridge damaged frequently by flood runoff. Forty-seven landtreatment activities and three structural activities are considered for programing.

PHILLIPS, RICHARD. FEED INDUSTRY FINANCING AND CONTRACT PROGRAMS IN IOWA AND SURROUNDING STATES. Iowa Agr. and Home Econ. Expt. Sta. Spec. Rpt. 28, 19 pp., illus. 1961.

The 26 feed manufacturers studied had a total of 120 financing and contract programs in operation—56 informal financing agreements, 46 formalized contractual programs, and 18 integrated programs with the companies sharing production risks with farmers. The 120 programs accounted for about 18.6 percent of total sales of hog, beef, and poultry feeds in the 6-State area in 1959.

RINEAR, EARL H. THE HATCHERY INDUSTRY: STRUCTURE, ECONOMIC CHANGES, PROBLEMS. U.S. Dept. Agr. Mktg. Res. Rpt. 483, 31 pp., illus. 1961.

Number of hatcheries declined more than 50 percent from 1935 to 1959, but average size of firm increased. The decline in numbers is expected to continue. Success of individual firms will depend on the ability of management to improve utilization of capacity, to lower costs, and to offer chick and poult lines which are generally acceptable. Hatching under franchise agreements has enabled many hatcheries to improve their operating performance and their competitive position.

ROSS, JAMES E. TRENDS IN PHILIPPINE AGRICULTURAL TRADE. U.S. Dept. Agr. Econ. Res. Serv. ERS-Foreign-3, 41 pp., illus. 1961.

Agricultural production in the Philippines in 1960 was about twice the prewar level. In agricultural trade, the big change in the past decade has been from imports of food commodities to relatively more imports of farm raw materials. Philippine imports of agricultural commodities annually amount to about $100 million; agricultural exports amount to over $300 million, or 70 percent of all export earnings.

ROSS, JAMES E., AND KIRBY, RILEY H. SOUTH KOREA'S AGRICULTURAL ECONOMY. U.S. Dept. Agr. Econ. Res. Serv. ERS-Foreign-2, 26 pp., illus. 1961.

Agriculture supports over 60 percent of the population of South Korea, and accounts for about 40 percent of the gross national product and about 15 percent of the foreign trade earnings. Per capita agricultural production has been increasing since the Korean conflict, but is still substantially below the prewar level. With continuation of present programs and with economic assistance from the United States, production should continue to develop at a moderate rate, but the country will remain a net importer of agricultural commodities for several years.

ULSAKER, N. L., BACK, W. B., AND LAGRONE, W. F. RESOURCES AND INCOMES OF RURAL FAMILIES IN THE OZARK PLATEAU OF NORTHEASTERN OKLAHOMA (A DESCRIPTIVE ANALYSIS). Okla. Agr. Expt. Sta. Processed Ser. P–377, 55 pp., illus. 1961. (Mimeographed.) (Agr. Res. Serv. cooperating.)

This section of Oklahoma is characterized by rough, hilly terrain. Therefore, its productive soils are limited. Rural families depend greatly upon nonfarm sources of income such as off-farm work, pensions, and welfare. Labor and land are both underemployed. Nonland capital tends to be the first limitation to more efficient resource use.

U.S. AGRICULTURAL RESEARCH SERVICE. FARM PRODUCTION: TRENDS, PROSPECTS, AND PROGRAMS. U.S. Dept. Agr., Agr. Inform. Bul. 239, 102 pp., illus. 1961.

U.S. GOVERNMENT PRINTING OFFICE: 1961

In the last decade, total farm production expanded at an unprecedented rate—27-percent increase. This change occurred despite a decrease in the acreage of land used for crops and a sharp decrease in the quantity of farm labor used. Increased use of fertilizer and lime, the number of tractors, the quantities of pesticides, formula feeds, and many other purchased inputs contributed, as did technological innovations. The prospect for the 1960's is for excessive farm production unless measures are taken to curb production; a growing population and high levels of exports are not likely to offset continued increases in yields of crops and livestock.

U.S. Economic Research Service. farm costs and location. U.S. Dept. Agr., Agr. Inform. Bul. 230, 85 pp., illus. 1961.

Contains estimates of costs and returns for 1960 and earlier years on 34 important types of commercial farms in 19 major farming areas in the United States, and analyses of changes in production, income, and costs of each of these types of farms in recent years. An annual publication.

Waldorf, Wm. H. output per man-hour in factories processing farm food products. U.S. Dept. Agr. Tech. Bul. 1243, 36 pp., illus. 1961.

The annual rate of growth of output per man-hour in food-processing industries from 1947 to 1958 was 2.7 percent, about the same as the yearly rate in the private nonfarm sector. During the same period, net output per man-hour in farming grew at an average annual rate of 6.2 percent.

Weidenhamer, Margaret. women's attitudes toward cotton and other fibers in clothing. U.S. Dept. Agr. Mktg. Res. Rpt. 493, 111 pp. 1961.

Reports results of survey of women's ownership of selected garments, their appraisals of different fibers, their use of informal attire for various activities, their problems in buying clothes, and details of their most recent shopping experiences.

White, J. H., Bolton, B., Wiegmann, F. H., and others. budgets for major farm enterprises in the mississippi river delta of arkansas, louisiana, and mississippi. La. Agr. Expt. Sta. D.A.E. Cir. 281, 129 pp. 1961. (Mimeographed.) (Agr. Res. Serv. cooperating.)

Crop and livestock enterprise budgets are divided into two parts—present technology and advanced technology. Enterprise budgets for crops are arranged by farm size and soil type. Each crop enterprise has three tables of information: (1) Estimated costs and returns per acre; (2) monthly distribution of labor requirements per acre; and (3) annual labor, power, and machinery requirements per acre.

Zimmer, J. M., and Stewart, C. E. farm production practices and inputs, strawberry valley project, utah. Utah Agr. Expt. Sta. Mimeo. Rpt., 35 pp. 1961. (Econ. Res. Serv. cooperating.)

Gives summary tables for the main irrigated field crops in the area—alfalfa, barley, wheat, corn for silage, sugarbeets, green peas for canning, and sweet corn for canning. The statement comprises three main sections: (1) Labor, power, and equipment used, by operations; (2) farm practices; and (3) machinery and equipment on farms.

Statistical Compilations

Butler, C. G., and LeGrande, C. W. milk: cows on farms, production per cow, and total production, by months, 1930–59. U.S. Dept. Agr. Statis. Bul. 289, 61 pp. 1961.

Crop Reporting Board, U.S. Dept. Agr. Statis. Rptg. Serv. chickens and eggs, farm production, disposition, cash receipts, gross income; commercial broilers, production, gross income. revised estimates—by states, 1955–59 including numbers on farms january 1, 1956–60. U.S. Dept. Agr. Statis. Bul. 287, 26 pp. 1961.

Crop Reporting Board, U.S. Dept. Agr. Statis. Rptg. Serv. field crops, by states, 1954–59; acreage, yield, production; revised estimates. U.S. Dept. Agr. Statis. Bul. 290, 66 pp. 1961.

Crop Reporting Board, U.S. Dept. Agr. Statis. Rptg. Serv. meat animals: farm production, disposition, and income, by states, 1955–59, revised estimates. U.S. Dept. Agr. Statis. Bul. 284, 37 pp. 1961.

Crop Reporting Board, U.S. Dept. Agr. Statis. Rptg. Serv. seed crops, by states, 1954–59. revised estimates; acreage, yield, production, price, value. U.S. Dept. Agr. Statis. Bul. 288, 31 pp. 1961.

Crop Reporting Board, U.S. Dept. Agr. Statis. Rptg. Serv. turkeys: farm production, disposition, cash receipts, gross income, by states. revised estimates 1955–59, including numbers on farms january 1, 1956–60. U.S. Dept. Agr. Statis. Bul. 286, 19 pp. 1961.

Farm Economics Division, U.S. Dept. Agr. Econ. Res. Serv. changes in farm production and efficiency. a summary report. U.S. Dept. Agr. Statis. Bul. 233, Rev. July 1961, 47 pp., illus.

Crop Reporting Board, U.S. Dept. Agr. Statis. Rptg. Serv. potatoes, sweetpotatoes, by states and seasonal groups; crops of 1954–59, acreage, yield, production, price, value, farm disposition, stocks (revised estimates). U.S. Dept. Agr. Statis. Bul. 291, 41 pp. 1961.

Growth Through Agricultural Progress

AGRICULTURAL ECONOMICS
RESEARCH

Is published quarterly by the Economic Research Service, U.S. Department of Agriculture. The printing of this publication has been approved by the Bureau of the Budget, Feb. 10, 1959.

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. 20 cents a single copy, 75 cents a year, domestic, $1 foreign.

C 7Agr

United States Department of Agriculture
Economic Research Service
Washington 25, D. C.

U. S. DEPT. OF AGRICULTURE
NATIONAL AGRICULTURAL LIBRARY
FEB 1 6 1963
CURRENT SERIAL RECORDS

February 1962

INDEX, AGRICULTURAL ECONOMICS RESEARCH

VOLUME XIII 1962

Page
Abstracts, world agricultural economics research 130
Agricultural Economics, U. S. Department of Agriculture, organization and history 69
Agricultural history, American documents 59
Cattle range industries, Montana 101
Cooperatives, tax exemption 136
Cost functions, from cross-section data 79
Cotton industry, U. S. competitive potential 61
Demand analysis, time series 37
Economic thought, history 22
Food stamp programs 74
Forestry
  Economics 27
  Legislation 132
Futures trading, seminar 97
Government, urban fringe 117
Grange League Federation, history 30
Income
  Farm, by commodity groups 15
  Purchasing power, urban, rural nonfarm, and farm 89
Industrial estates 33
Investment policy and legislation, underdeveloped countries 95
Land use planning
  Urban growth 101
  Worcester Co., Mass. 29
Linear economic models 25
Machinery
  Agricultural mechanization 100
  Combines, buying vs. renting 109
  Steam cultivation, British farming 60
Management, farm 26
Manioc in Africa 32
Marketing, agricultural
  Cooperative, Florida Citrus Exchange 60
  General 133
  India 134
  Latin America 99

Page
Meat, seasonal demand 1
National parks, policy history 136
Operations research 64
Organization theory, implications for
  economic theory 24
Physical distribution, management 134
Price discrimination 62
Production functions 135
Rice, U. S. consumption 137
Schools
  Financing, State vs. Federal 63
  Rural problem areas 122
Statistics, elementary 98
Tobacco, history 31
Transportation, economic effects 26
Water
  Irrigation, water rental 54
  Watershed planning 102
Wholesaling 98

AUTHORS

Anderson, Raymond L.
    The Irrigation Water Rental Market: A Case Study 54
Atherton, Lewis
  Book review: Readings in the History of American Agriculture
    edited by Wayne D. Rasmussen 59
Boles, J. N.
    Cost Functions from Cross-Section Data--Fact or Fantasy?
      With J. F. Stollsteimer and R. G. Bressler 79
Bressler, R. G.
    Cost Functions from Cross-Section Data--Fact or Fantasy?
      With J. F. Stollsteimer and J. N. Boles 79
Cavin, J. P.
  Book review: A History of Economic Thought: Social Ideals and
    Economic Theories from Quesnay to Keynes, by Overton H. Taylor 22
Church, Donald E.
  Book review: Economics of Transportation, Fifth Edition, by
    D. Philip Locklin 26
Cochrane, Willard W.
    The Role of Economics and Statistics in USDA 69
Conover, Arthur G.
  Book review: Tobacco and Americans, by Robert K. Heiman 31
Davis, Howard P.
    Some Economic Aspects of Food Stamp Programs, with
      Frederick V. Waugh 74
Donald, James R.
  Book review: The Competitive Potential of the U. S.
    Cotton Industry, by Clifton B. Cox and Vernon W. Phenson 61
Egbert, Alvin C.
  Book review: Agricultural Production Functions, by
    Earl O. Heady and John L. Dillion 135

Folkman, William S.
Rural Problem Areas Need Better Schools 122
French, Burton L.
Book review: The Theory of Linear Economic Models, by David Gale 25
Hall, William F.
Book review: Agricultural Marketing in India and Abroad, by R. S. Snivastava 134
Harlow, Arthur A.
Book review: Modern Elementary Statistics, by John E. Freund 98
Book review: Operations Research and Systems Engineering, edited by Charles D. Flagle, William H. Huggins, and Robert H. Roy 64
Herrmann, Louis F.
Book review: Marketing in Latin America, by Frank Montgomery Dunbaugh 99
Howell, L. D.
Book review: The Price Discrimination Law: A Review of Experience, by Corwin D. Edwards 62
Johnson, Hugh A.
Book review: Agriculture and Urban Growth, by G. P. Wibberley 101
Johnson, Sherman E.
Book review: Rural Planning of One County--Worcester County, Massachusetts, by John D. Black and George W. Westcott 29
Jones, Lawrence A.
Book review: Agricultural Credit in Economically Underveloped Countries, by Horace Belshaw 95
Book review: Investment Policy and Investment Legislation in Under-Developed Countries, by Reinhard Kovary 95
Kriesberg, Martin
Book review: Wholesaling in Marketing Organization, by David A. Revzan 98
Kulp, Paul R.
Book review: Industrial Estates: Tool for Industralization, by William Bredo 33
Lord, William B.
Book review: New Laws for New Forests, by Erling D. Solberg 133
Mighell, Ronald L.
Book review: Futures Trading Seminar--History and Development, principal papers by Henry H. Bakken, Roger W. Gray, Thomas A. Hieronymus, and Allen B. Paul 97
Mischler, Raymond J.
Book review: The Tax Exemption of Cooperatives, Second Edition, by Robert T. Patterson 136
Norcross, Harry C.
Retail Value and Farm Income by Commodity Groups 15
Ogren, Kenneth E.
Book review: Marketing of Agricultural Products, by Richard L. Kohls 133

Page

Pavelis, George A.
  Book review: Economics of Watershed Planning, edited by George S. Tolley and Fletcher E. Riggs 102
Post, Robert E.
  Book review: Rice--Domestic Consumption in the United States, by Parley M. Pratt 137
Parsons, Merton S.
  Book review: Mechanization in Agriculture, edited by J. L. Meij 100
Paul, Allen B.
  Book review: Economic Theory and Organizational Analysis, by Harvey Liebenstein 24
  Book review: Physical Distribution Management, by Edward W. Smykay, Donald J. Bowersox, and Frank H. Mossman 134
Pond, George A.
  Book review: The Farm Management Handbook, Third Edition, by I. F. Hall and W. P. Mortenson 26
Pubols, Ben H.
  Book review: Fifty Years of Citrus--The Florida citrus Exchange, 1909-59, by James T. Hopkins 60
Puterbaugh, Horace L.
  Purchasing Power of Urban, Rural Nonfarm, and Rural Farm Income, 1955 89
Rasmussen, Wayne D.
  Book review: Free Grass to Fences: The Montana Cattle Range Story, by Robert H. Fletcher 101
  Book review: God Speed the Plow: The Coming of Steam Cultivation to Great Britain, by Clark C. Spence 60
  Book review: Our National Park Policy: A Critical History, by John Ise 136
Rojko, Anthony S.
  Time Series Analysis in Measurement of Demand 37
Shapiro, Harvey
  Book review: Taxes for the Schools, by Roger A. Freeman 63
Skinner, Snider W.
  Book review: Manioc in Africa, by William O. Jones 32
Smith, Edward J.
  Buying Versus Renting a Combine 109
Stanton, B. F.
  Seasonal Demand for Beef, Pork and Broilers 1
Stocker, Frederick D.
  Governmental Problems on the Urban Fringe 117
Stollsteimer, J. F.
  Cost Functions from Cross-Section Data--Fact or Fantasy? with R. G. Bressler and J. N. Boles 79
Upchurch, M. L.
  Book review: Fundamentals of Forestry Economics, by William A. Duerr 27
Waugh, Frederick V.
  Some Economic Aspects of Food Stamp Programs, with Howard P. Davis 74
  Book review: Seeds That Grew: A History of the Cooperative Grange League Federation Exchange, by Joseph G. Knapp 30